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APPENDIX (C.)  
TO THE  
REPORT of the GENERAL BOARD of HEALTH  
ON THE  
EPIDEMIC CHOLERA  
OF  
1848 and 1849.

ABSTRACT OF REPORT BY JAMES WINSE, M.D.,  
ON EPIDEMIC CHOLERA, AS IT PREVAILED IN THE UNITED STATES IN  
1849 AND 1850.

*Presented to both Houses of Parliament by Command of Her Majesty.*



LONDON:  
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOOD,  
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY,  
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1852.

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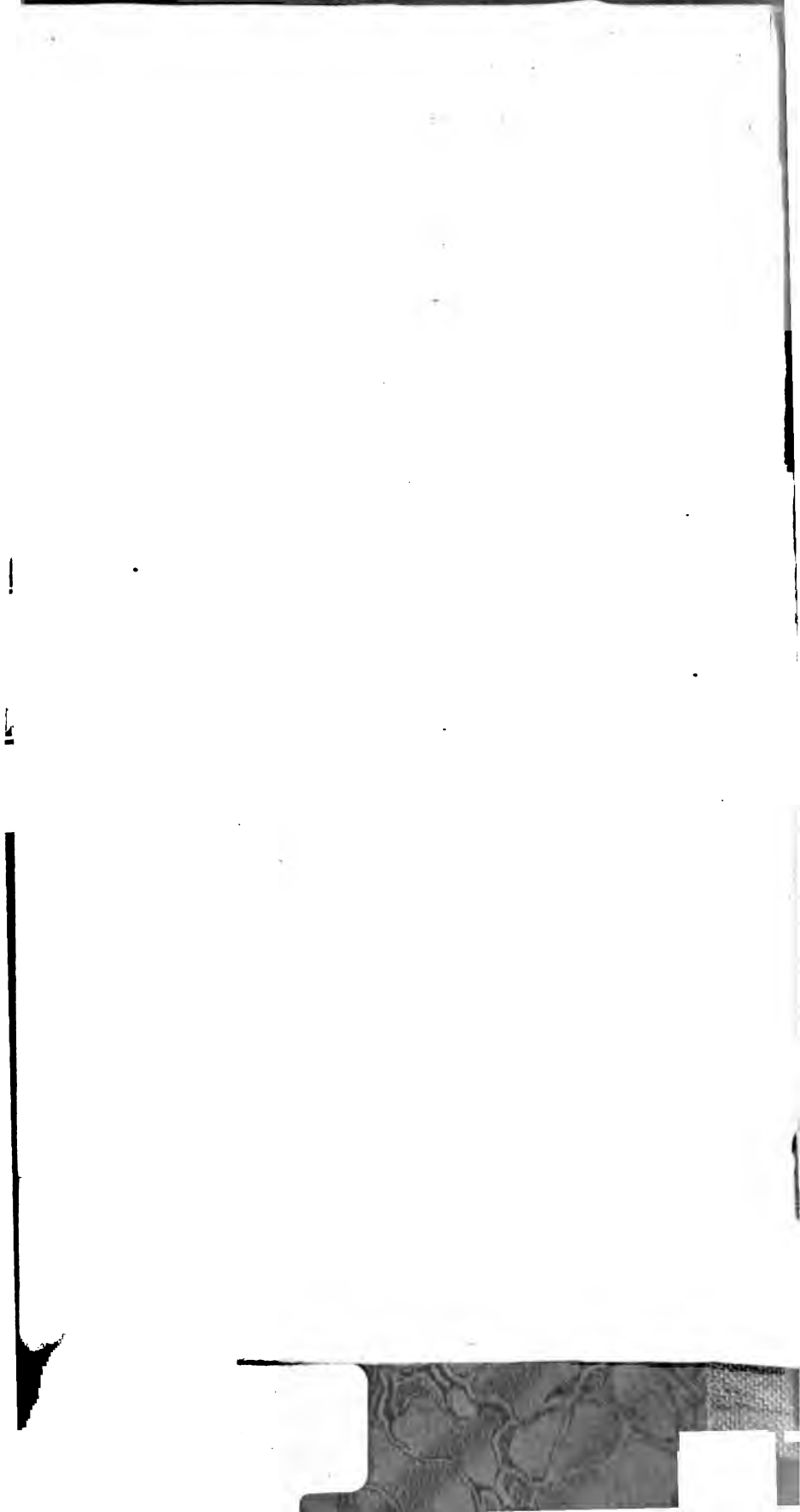
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APPENDIX (C.)

TO THE

REPORT OF THE GENERAL BOARD OF HEALTH

ON THE

EPIDEMIC CHOLERA

OF

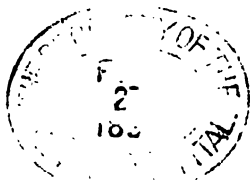
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topographical or geological nature.

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APPENDIX C.

ABSTRACT\* OF  
REPORT ON EPIDEMIC CHOLERA,

AS IT PREVAILED IN THE  
UNITED STATES IN 1849 AND 1850.

By JAMES WYNNE, M.D.,

*Chairman of the Medical Department of the National Institute;  
Chairman of the First Committee of Public Hygiene of the  
American Medical Association, &c. &c.*

ASIATIC cholera, in its recent visit to this country, first manifested itself at Staten Island, in the harbour of New York, on the 2d of December 1848, and nearly coincident with this at New Orleans. The first case of cholera at the latter place occurred on the 11th of December 1848, so that but nine days intervened between its appearance at New York and its development at New Orleans. From these two great commercial centres it spread nearly over the whole territory embraced within the limits of the United States. From New York it found its way up the North River to New Albany, and thence pursued its westerly direction along the great lines of travel to Buffalo, and up the great chain of Lakes. From its more southern focus it passed up the Mississippi river and its tributaries to their sources, leaving scarcely a village unvisited, and inflicting the most frightful ravages in the larger commercial towns it met in its passage.

In New Orleans its spread was much more alarming. Dr. Fenner says,—

"That previous to its outbreak the weather had been changeable, for the most part very warm, though there had been several white frosts. Yellow fever had almost disappeared, and there was but little sickness prevailing, though, among the existing diseases, were observed some remarkable cases of stomach and bowel complaints. On the 5th of December I attended a gentleman in Custom-house-street, who laboured under vomiting, pains and spasms in the bowels, and prostration to such a degree, that if epidemic cholera had been supposed to be here, no person would have hesitated to pronounce his a case. He had no rice-water evacuations, his bowels were rather costive, and he vomited bile; but many such cases have been seen since the epidemic was declared. He recovered after two or three days illness, and has not been sick again.

"Some days previous to this, three or four negroes were attacked with cholera on the same night in Gravin-street; they were promptly treated, and all soon recovered. Similar cases were observed in the practice of a number of physicians in different parts of the city, all tending to show, as it appears to me, that the epidemic influence was gradually being matured and developed in our midst."

\* It has been deemed unnecessary to publish such portions as are purely of a topographical or geological nature.



#### 4 *Spread of Cholera from New Orleans to Memphis.*

The following official report of the Board of Health exhibits the weekly mortality from cholera and other diseases.

*Official Weekly Reports of the Board of Health.*

Week ending—	Cholera.	Other Diseases.	Total.	Week ending—	Cholera.	Other Diseases.	Total.
December 2 -	-	48	48	April - 14 -	73	124	197
" 9 -	-	48	48	" 21 -	101	131	232
" 16 -	26	90	116	" 28 -	70	107	177
" 23 -	234	117	351	May - 5 -	114	111	225
" 30 -	538	124	662	" 12 -	127	108	235
January 6 -	392	160	552	" 19 -	103	99	202
" 13 -	156	127	283	" 26 -	95	98	193
" 20 -	110	96	206	June - 2 -	69	51	120
" 27 -	no Report.			" 9 -	82	100	182
February 3 -	53	89	142	" 16 -	66	87	153
" 10 -	86	91	177	" 23 -	47	71	118
" 17 -	64	93	157	" 30 -	32	81	113
" 24 -	4	70	74	July - 7 -	15	77	92
March - 3 -	25	87	112	" 14 -	4	94	98
" 10 -	50	112	162	" 21 -	-	94	94
" 17 -	204	92	296	" 28 -	2	64	66
" 24 -	204	92	296	August 4 -	1	85	86
" 31 -	238	140	378				
April - 7 -	116	109	225	Total - -	3,501	3,367	6,868

From New Orleans the disease spread in all directions.

"Almost every vessel," says Dr. Fenner, "that left the city, a few days after the disease commenced, had cases aboard, and on some of the steamboats going up the river there were 20 or 30 cases, and many deaths: thus persons having the disease, and dying with it, were carried to all the landing towns and cities up the river as high as Cincinnati."

The plantations in the immediate vicinity of New Orleans, and those on the Red River, as well as the town of Shreveport, were first visited by it, and on the 22d of December it had reached Memphis, in Tennessee.

Memphis is a place of considerable commercial importance, situated on the Mississippi river, about 900 miles above its mouth, in N. lat. 35° 08', and W. lon. 90° 05'. It is built upon Chicksaw bluff, and is underlaid by a bed of loam composed of cretaceous deposit. Its site is upwards of 160 feet above low-water mark, and occupies a slightly undulating plain terminated on the north by Woly river, which empties into the Mississippi a short distance above the town, in the midst of low lands subject to overflow. From the junction of the Woly river with the Mississippi, by a rapid deposit which began to form in 1829, many acres are now added to the land where steamboats formerly landed, and the steamboat-landing has consequently been transferred some distance from the town, and the space betwixt them constitutes a wide battune. It is a town of rapid growth, and was selected by the Government recently as a naval depôt on account of its supposed healthfulness.



*First Cases could have had no Communication.* 5

Dr. Shanks, in his account of the prevalence of the disease at this place, says,—

“About the 20th of last October the rainy season commenced here, and from that time until the 29th of December, with the exception of occasionally two or three fair days, it continued to be cloudy, and to rain frequently in very heavy and protracted showers, so that the streams in the country were generally unusually high, and the earth was kept saturated with water. During this long continuance of rain the temperature of the atmosphere was uncommonly warm for the season, and this was particularly so during the latter part of December, up to the time when cases of cholera became sufficiently numerous to induce the Board of Health to announce its existence here, to a limited extent, as an epidemic, especially among the flat-boat population along the landing.

“In connexion with this account of the weather, it may be proper to state that about the middle of December, influenza within a few days affected a very large proportion of the population of Memphis, and extended over the country. Generally the disease was mild.”

On the 20th of December, the steamboat “Convoy,” which runs in the Memphis and New Orleans trade, arrived in four days, with two or three cases of cholera among the hands on board. On the 22d of December, Dr. Shanks was called to see a boy, who was in the habit of attending at the wharf to sell fruit to passengers, in a state of collapse; he was at the landing when the “Convoy” arrived, but did not go on board.

The next two cases were those of a man and woman, who were on board of flat-boats a quarter of a mile from the steamboat landing, and 150 yards from each other;—the one died on the 29th, and the other on the 30th, of December. Six other deaths occurred in sight of each other on the 31st, among the flat-boat population, and two passengers landed from the steamboats on their way up the river from New Orleans. On the 1st of January, the disease had become general among the flat-boat population, and those living adjacent to them on shore, and several deaths took place “under circumstances that rendered it impossible for the disease to have spread by actual contact.”

“To better understand,” remarks Dr. Shanks, “the impossibility of the disease spreading so rapidly among this river population, by communication from one to another, or from direct communication with the steamboats at the landing, it is necessary to be known that the principal steamboat landing is in front of the lower part of the city, and that the flat-boat landing extends from the steamboat landing along and up the river to the navy yard; and at this season of the year, when a large number of flat-boats, laden with produce, stock, &c. from the upper country, accumulate here, they stop above the city and the navy yard, so as to extend the line of flat-boats nearly two miles in front, and above the town. At the time the cholera commenced, there was a larger number of flat-boats at the landing than usual, stopping here on account of the dread of the cholera below; the population connected with them, and with a few produce houses near the river, was estimated at about one thousand. Between this population and the steamboat landing, there was but little communication, so that but few, if any, of those who were attacked, could either have been on board of infected steamboats from New Orleans, or in contact with cases of cholera. This is rendered more certain from the fact, that by the 2d of January cases and deaths had occurred on different boats, from one extremity of the landing to the other, and one or two died at the upper part of the landing, a mile above town, who had never been down, either to the lower landing or in town.”—*Shanks on Cholera.*—*American Journal of Medical Science*, vol. xviii. p. 16.

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8      *Colonel Key's Replies to Queries of Dr. Booth.*

In 1850 the disease renewed its attack as an epidemic on the 19th of June, and continued until the 30th of July; deaths, 301. The deaths for the two years from this disease were 606.

Dr. Booth, in "Fenner's Southern Medical Reports," has communicated some facts in connexion with the appearance of cholera upon the plantations in La Fourche, which are particularly valuable, as bearing directly upon the spread of the disease from one plantation to another.

Dr. Booth, with the commendable intention of serving the cause of truth, addressed the following inquiries to those whose families or servants suffered from this disease:—

- "1st. By what means did the cholera reach your plantation?"
- "2d. When did it attack it, and in what kind of weather?"
- "3d. How long did it last?"
- "4th. What form of cholera was it?"
- "5th. How many were attacked?"
- "6th. How many died?"
- "7th. What was the general plan of treatment?"
- "8th. How many cases collapsed?"
- "9th. How many of these recovered?"
- "10th. How many persons lived on your place?"
- "11th. Did any of your *adjoining* neighbours suffer from this disease?"
- "12th. Did it prevail on your plantation when it travelled over this country before?"

To which he received, among others, the following replies:—

*Colonel Key's Statement.*

"The negroes first attacked were engaged in 'sugar-rolling,' and had no communication with the bayou or Thibodaux.

"The first case occurred on the 29th of December. The patient was a young negro man, subject to diarrhœa; he died. *The weather was then misty, cloudy, and warm for the season; about the 1st of January it changed to cold and CLEAR.*

"The cholera continued from 27th December to 10th January; within this period there were about 20 premonitory attacks, and three young and likely men died.

"In April the cholera re appeared; two men and a child died within the first week; about 20 premonitory attacks again occurred. *The weather was delightful.* The disease appeared again in the last of May; an infant of the Colonel's, and a middle-aged negro man and woman died. Two other children of the Colonel's were attacked about the same time, and about 20 premonitory attacks again took place among the negroes; in all 60 or 65 attacks and nine deaths.

"Only two children and very few women were attacked; all fared alike.

"There were about 150 on the place; none of the adjoining neighbours had the disease. This plantation was visited by the cholera in 1832 or 1833."

"*Thibodaux.*—Colonel Key's residence and negro quarters are two miles below Thibodaux, and the upper part of his plantation is connected with it by a series of dwelling-houses. The first cases of epidemic cholera occurred here the 26th of December, the last about the middle of October following. Its two principal attacks or visitations were from the 24th of January to the 3d of February, and from the 2d to the 14th of October. I learn from my books that cases occurred the last of May, the last of June, and the middle of July. The form of cholera was mild; two cases appear to have been malignant; the number of attacks and deaths are not known; neither were numerous.

"How the poison reached here we cannot tell, nor are we disposed to deny that it has remained ever since its arrival, embracing every opportunity created by exciting causes to exhibit itself. Its last appearance was attended





by the following circumstances:—Mr. Ayres, a respectable mechanic, of good habits, was working on a plantation three or four miles up the bayou, on which there had been no cholera; he was attacked with diarrhœa, had fourteen passages, then got on a horse, and rode to town; was almost exhausted when he arrived; began to vomit, and continued to purge until he collapsed and died.

"The next morning an old negro man who waited on him, went into collapse without any known warning, and died. A female who came over to see Ayres was also attacked the same day; and the day after a man who visited the old negro; a fellow-servant of the old negro, was also attacked within ten days.

"During this period, other cases, apparently unconnected with these, occurred in different parts of the village, but there was only one death among these, and I suppose the cases seemingly traceable to Ayres, constitute at least one third of all the indisputable cases of cholera which have occurred since his death.

"Ayres died in a house the former inmates of which had been particularly afflicted by cholera in February. The owner was attacked there, but died in a different part of the town; and three out of his five servants had it in this house; one of them died. These attacks took place successively, and were traceable from one to the other."

*Judge Guion's Statement.*

"On the 26th of December a boy seven years old, who stays about the house, was attacked. He had not been from home. His symptoms were vomiting, purging of rice-water, and cramps. This was the first case.

"A second case occurred about the 1st of January. A negro man was the subject. He had visited town. It is not known that he came into contact with any afflicted persons. He had no symptom but 'rice-water purging.'

"These cases were treated with opium, calomel, assafoetida, and red pepper tea, in large doses. Both recovered.

"No others were attacked at this time. *The weather was misty and murky.*

"In the latter part of January, two or three cases occurred, and one died. *The weather was cold and clear.* About the last of February, two or three others were attacked; all recovered. Cartwright's old prescription was now adopted in full. The weather was rainy. About the 10th of March, two were attacked; both recovered. The disease was of the mild form. Total of attacks, 10; one death; 80 or 90 on the plantation.

"Judge Guion's plantation adjoins Thibodaux. His residence, and negro cabins are from a quarter to half a mile from its upper boundary. During the periods in which the cholera appeared at the Judge's, only one or two cases of it had occurred in the upper third part of the town. The disease had mainly raged about its centre.

Two large plantations and a line of dwelling-houses intervene between Judge Guion's and Bishop Polk's.

*Bishop Polk's Place. Mr. Boatner the Overseer's Statement.*

"The first case of cholera on Bishop Polk's place occurred the 3d of May; the last on the 10th of June. During the prevalence of the epidemic there were several showers, and one heavy rain with a good deal of wind; but, as a general thing, the weather was very fine.

"The disease was of the malignant form. There were 356 negroes, 273 had cholera 69 died; *three collapsed cases recovered.*

"W. Blount lives about two miles above Bishop Polk. Colonel Allen's plantation intervenes between their residences. January 14th, his daughter, a young lady of twelve or fourteen, had cholera. The last of May, a negro woman; the last of June, or the 1st of July, a negro child; and on the 20th of July, Mrs. B. had it. The child died suddenly, being in collapse before it was known to be sick. The other cases were of the mild form. Mr. Blount had 10 or 12 in family."



10 *Statements of Mrs. White, Messrs. Hymel, Tete, Osborne,*

Two or three miles above Mr. Blount's residence, and connected with it by a line of settlements, is the plantation of Mrs. White.

*Mrs. White and Doctor Doncereux's Statement.*

"The cholera reached here by means of the atmosphere. It prevailed in all kinds of weather; it lasted two or three months; it was of the mild form; 15 cases, 5 serious ones, 3 deaths. Opium in small doses frequently repeated, and calomel in full doses, were the main medicines resorted to. None of the adjoining neighbours were attacked; the cholera prevailed in this place in 1832 or 1833."

Having travelled 14 miles on this side of the bayou, we will go to a ferry about two miles farther up, cross over, and travel down the opposite side; a little above the ferry is the plantation of Mr. Hymel.

*Mr. Hymel's Statement.*

"It is not known how the cholera reached here; every means were used to prevent its appearance; the negroes were not exposed to it; the first case occurred about the 1st of February; the weather was then very fine. The epidemic continued to break out at intervals up to the 12th of August; at first it seemed to be mild, towards the last the cases were of the malignant form; there were 50 on the place; 45 were attacked, 10 died, 8 blacks, and 2 whites. The cholera prevailed here in 1832 or 1833; two or three white persons died."

Two miles below Mr. Hymel is the plantation of Mr. A. Tete,

*Mr. Tete's Statement.*

"My negroes had not been exposed to the disease; they were attacked on the 13th of January; the weather was unpleasant, but not rainy. The cholera raged here about one week, it was malignant; there were 55 on the place, 18 were attacked, 12 died."

"None of my adjoining neighbours were attacked. I do not know whether or not it attacked this place on its previous visit to this country."

Nearly three miles below Mr. Tete lives Mr. Osborne.

*Mr. Osborne's Statement.*

"An Irishman visited two of my cabins at night, or a little before day, February 13th, and vomited what was supposed from the smell to be liquor; he immediately went away, and was found some hours after in a state of collapse by the road-side. I had him carried to a shanty a mile back. The negro, in whose cabin he tarried the longest, did not have cholera at all. The other into whose house he went was among the first attacked. I was with the Irishman a good deal, and had some time subsequently only a slight attack. The negro who nursed him mostly, escaped entirely. From the shanty he was removed to Mr. Broux's, an adjoining neighbour's, sugar-house, where he died. A good many of Mr. Broux's negroes were about him; none of these were attacked. Mr. Broux was attacked with vomiting and purging next day, but he is subject to such attacks. February 15th, at 11 o'clock in the forenoon, my foreman, who was one of my healthiest and strongest men and lived in the best cabin, was attacked. The Irishman had been in his cabin a few moments, but he had not touched or had anything to do with him."

"I had 41 negroes, 37 or 38 were attacked, 19 died; 6 men, 7 women, and 6 children. Two or three of these were infants; the others were from two to nine years old; only one collapsed case recovered."

"As soon as the disease appeared, the negroes were removed a mile back, but were brought to the old quarters as soon as they were attacked. After it had raged awhile, they were moved below Thibodaux. One was attacked there and died, two remained at home, one of these escaped entirely, the other was the last that died."

*Billow, and Donaldson.—Premonitory Diarrhoea.* 11

"The disease was of the malignant form; average time from attack to collapse, from one to two hours; 15 of the deaths occurred within the first eight days; one died salivated, and it is thought without discharge. The last case died on the 13th of March.

"None of the adjoining neighbours had the disease, although the dwelling-house of one is closer to my quarters than my own, and it is supposed that some of the negroes on one or the other of the adjoining places stole the clothes left by my negroes when removed below town.

"The cholera was never on this place before. It raged on the adjoining plantation below me in 1832 or 1833. During its ravages here, there was a manifest increase of diarrhoea on this plantation. It is not known where or how the Irishman took the disease."

Two miles below Mr. Osborne's plantation is that of Mr. Billow.

*Mr. Billow's Statement.*

"Hector, an elderly negro man, who was in the habit of visiting the town daily, was attacked on the 16th of June, in returning from town, and found in collapse upon the banks of the bayou. He was carried home, died in five hours, and was buried the same evening. Four negroes waited on him, two others assisted in putting him in the coffin, none of these were the first attacked. All the negroes attended his funeral, but the coffin was nailed up before they came into its vicinity. It is supposed that there was no cholera in town at this time.

"The second attack occurred on Tuesday, eight days after Hector's death. A girl had been sick of a fever, went out well on Monday, ate a roasting-ear, and was found the next morning before daybreak in collapse; she threw up the corn.

"One Wednesday (nine days afterwards), two cases occurred; one died. A woman was attacked Thursday night, and died Friday; she had nursed the sick. On Saturday, two were attacked and died the same day; one of these had waited on the sick.

"There were 46 negroes, 10 were attacked, 7 died. The three that recovered were mulattoes; no mulatto died; the disease was of the malignant form. Hector was supposed to have had a premonitory diarrhoea.

"The average time from attack to collapse was from half an hour to two hours."

One plantation separates Mr. Billow's from Donaldson's and Nelson's.

*Mr. Donaldson's Statement.*

"Mr. Donaldson does not know how the cholera reached his plantation. He had just built new quarters, cleaned up the premises, whitewashed the cabins, and used every customary precaution. Obstinate diarrhoea, influenza, and croup had been epidemic among the negroes some weeks before, and up to the first case of cholera.

"This case occurred on the 14th of June; the patient died on the 15th. He had premonitory diarrhoea; had not been off the place.

"The weather had been dry and clear. It changed on the day after the burial of this man, and continued rainy the balance of the time.

"Within three or four days after his death, about 15 premonitory attacks occurred. Cases then took place for four weeks. The last three cases died; no completely collapsed case recovered; one who entered the limits of collapse got well, 13 died; there were about 190 or 200 on the place, very few escaped a slight attack; the most of them took some medicine; the overseer and Mr. D.'s lady and children were attacked. Major Nelson and Mr. D., who had visited various places where the cholera was raging, escaped entirely.

"The negroes were 'scattered,' or 'thinned,' as soon as the second death occurred.

"The very night on which they were scattered, about 30 were attacked, including some of those removed, and some of those who remained; one who lived at the sugar-house was attacked, also the ostler who lives in an isolated house, and two who reside in the yard of the dwelling-house.

"A few cases of cholera, and deaths therefrom, occurred on this plantation in 1832 or 1833."

One plantation lies between Mr. Bibb's and Donaldson and Nelson's; the stench from Mr. Bibb's graveyard, during the prevalence of the epidemic there, was disagreeably perceptible to the family residing on this plantation, yet no case occurred here until the last of July, or the 1st of August; then one of the negroes had an attack, of which he recovered. Mr. Bibb's plantation is opposite the lower part of Thibodaux.

*Mr. Bibb's Statement.*

"The cholera appeared here about the 1st of May; some of the negroes were in the habit of visiting Thibodaux, but these were not the first attacked; a woman and an infant, neither of whom had been off the place, were the first cases.

"The cholera lasted three weeks, the weather was pleasant the greater part of this period, but several times became cool and rainy; at these times the cases were much more numerous and fatal; at one such period there were 27 corpses in the houses at once; these victims had died within two days.

"The first cases were of the malignant form, the premonitory period being only of three or four hours duration; out of about 30 collapsed cases of this form only two recovered; out of the last 56 collapsed cases, seven recovered.

"There were 330 on the place, nearly 300 were treated for cholera, 69 died, 9 collapsed cases recovered.

"Neither of my adjoining neighbours were attacked by the epidemic; it is said to have prevailed here in 1832 or 1833."

Shortly after the appearance of the disease at New Orleans, cases of cholera were taken by the steamboats plying between that city and St. Louis to this latter place, and were admitted into the St. Louis hospital, so that a few deaths were reported during the latter part of December.

St. Louis is built upon a bed of limestone rock, covered with a deposit of loam on a gentle curve in the Mississippi river, about fourteen hundred miles above its mouth, in N. lat.  $38^{\circ} 37' 28''$ , and W. lon.  $90^{\circ} 15' 39''$ ; the southernmost part of the town, which lies contiguous to the water, is upon low ground, subject to overflow, and in immediate contiguity with a shallow part of the river, which intervenes betwixt the shore at this point, and a low marshy deposit of sand and loam called "Duncan's Island." The stream is here edged with a narrow marsh of considerable length.

The town in its front approaches close to the water's edge, being separated from it by a narrow wharf, along which the range of houses fronting the river is built, but at so slight an elevation as to be subject to overflow upon the intervention of any sudden rise of the river. The ascent from this quay is regular and gradual for five squares back, when it subsides into a level plain, about 80 feet above low water; from this plain an irregular stream or basin, called Chouteau's pond, traverses the south-western part of the town, and empties by a narrow outlet into the bayou in front of Duncan's Island.

Upon the Illinois side of the river lies the American bottom, a rich alluvial deposit, terminated by bluffs; and opposite St. Louis, about eight miles in width, this bottom abounds in sloughs and bayous, which are partially dried in summer to be replenished in winter, and is covered by a rank vegetation, and peculiarly liable to miasmatic diseases, much more so than the opposite side of the river, although the suburbs of St. Louis are far from being free from autumnal fevers.

It is a place of great commercial advantages, and must always remain the principal town on the Mississippi river above New Orleans. Its growth has consequently of late years been very rapid, and large accessions have been made to its population by immigrants from Germany; its present population is 85,000.

The Missouri river joins the Mississippi 18 miles above St. Louis, and imparts to the stream those turbid waters which characterize the river from this point to its outlet into the Gulf of Mexico. The water of the Mississippi above this juncture is transparent, and of a light brown colour. The town is supplied with this river water, drawn from the bed of the stream by a forcing pump into a reservoir, and distributed by pipes through the town. This water is highly charged with a sediment, which is never so precipitated as to leave it free from a turbid appearance. This deposit consists, according to an analysis made by Dr. Raymond, of Cincinnati, of—

Silica	-	-	-	-	-	48 00
Alumina	-	-	-	-	-	18 50
Oxide of iron	-	-	-	-	-	14 00
Carbonate of lime	-	-	-	-	-	8 00
Phosphates of alumina and iron	-	-	-	-	-	1 00
Vegetable mould or geine	-	-	-	-	-	3 00
Undecomposed organic matters	-	-	-	-	-	7 50
						<hr/> 100 00 <hr/>

"The salubrity of the Mississippi water," remarks Dr. Drake, in his able work on the Interior valley of North America, "or that of the Missouri, which imports the character of turbidness, is not an open question. From St. Louis to New Orleans the testimony of the population on its banks, and of those who spend a great part of their lives upon it as watermen, is unequivocally in its favour. Many persons drink it before its suspended materials have subsided, and seem to prefer it to that which has been rendered transparent by time or art. That it produces some effects on the system, which transparent water from wells and springs, and even other rivers, does not, is an established popular opinion; it is even regarded by many persons as being, to a certain extent, medicinal, and especially adapted to the cure of chronic functional disorders of the stomach, bowels, and liver—an opinion in which I am inclined to concur."—*Drake's Systematic Treatise*, p. 72.

The immediate effect of the use of this water in my own case was a slight diarrhoea, which I understood to be a usual consequence of its employment by strangers. I afterwards grew fond of it, and found spring-water tasteless and insipid when compelled to return to its use after that of the Mississippi for a few weeks.

The first case originating in St. Louis occurred on the 5th of January 1849, in the person of a stout healthy man, who had returned



about four months previously from New Mexico, and was employed in the upper part of the town as a labourer; he had not had any intercourse with persons affected with cholera, nor had he been in any known manner exposed to the influence of the disease. This man, although labouring under a slight diarrhoea, partook of a hearty dinner, at which he ate plentifully of sour-kraut, upon the day of his attack. Two or three hours after dinner he was seized with vomiting, purging, and cramps; at four o'clock in the afternoon he was taken to the St. Louis hospital. His disease, at the period of the attack, had all the characteristics of Asiatic cholera, from which disease he died at two o'clock in the following morning.

On the 7th of January an Irish boatman, out of employment, was brought to the hospital with all the characteristic symptoms of cholera; he had laboured under diarrhoea for several days prior to his attack, and was guilty of imprudence in diet; he was discharged in a few days cured.

The next case occurred on the 17th, 10 days afterwards; the patient, a middle-aged labourer, was brought into the hospital in a state of collapse, and died during the night.

On the following day (18th January), a man was brought to the hospital from a house in St. Charles-street, who had suffered from diarrhoea for several days; he died on the 20th. On the 20th a female was brought from the same house as that of the patient last attacked, and died in 12 hours after her admission into the hospital. Several other cases of the disease subsequently occurred in the house in St. Charles-street, from which these two last patients were taken, and this street became one of the principal centres from which the disease afterwards radiated.

The St. Louis Medical Journal for March 1849, says,—

"Since the 1st of January up to the present time, 67 deaths have been reported as occurring from cholera; of these, at least one-half were persons who contracted the disease in New Orleans, or on their way from that city to this, and who were landed here in an almost dying condition; the remaining cases have been of local origin. During the same period 47 cases have been admitted into St. Louis hospital, of which 20 have died, and 27 recovered. Of the 20 fatal cases, a large majority were admitted either from boats, or obscure and filthy parts of the city, in a state of complete collapse."

But four deaths occurred during the first week in February, and all of these were cases taken from steamboats, and carried to St. Louis hospital; and during the whole month but 20 deaths were reported from cholera, being 18 less than in the preceding month, furnishing reasonable ground to hope that the disease was about to leave the city. In April, however, the number of cases considerably increased, 131 deaths taking place from cholera, and 456 from all diseases.

During the month of May the number of cases had increased to such an extent as to induce the greatest alarm, and lead to the apprehension, too fearfully realized, of a greater mortality than had yet taken place. By the 1st of June the epidemic had developed itself in great intensity; and on the 28th, the daily mortality reached 123 deaths from this disease alone. Its most frightful ravages were exhibited in the months of June and July, after which it began rapidly to decline.

*Filthy and undrained Localities chiefly affected.* 15

"The whole number of deaths from the cholera during the year was 4,557; from other diseases, 4,046, making in all, 8,603."

At the commencement of the epidemic the population of St. Louis was estimated at 70,000 (according to the census of 1850, the population was 85,000); but this number was reduced by July to 50,000.

The mortality up to the month of May was chiefly confined to the lower classes and the emigrants from Europe, who arrived in large numbers, debilitated by long confinement on shipboard, and in the most favourable condition for contracting the disease, when introduced into the atmosphere freighted with the seeds of the pestilence. After this period, its diffusions became more general.

"From the commencement of cholera in St. Louis," says Dr. M'Pheeters, in his able report, "to its termination, there were certain localities in which the disease raged with peculiar violence. These points seemed to act as foci from whence the disease radiated to other parts, and the facts connected with them form an interesting subject of inquiry, especially as they were regarded by those who advocate the doctrine of contagion as having an important bearing on the subject.

"The first of these infected localities which attracted public attention was a house situated near the corner of Seventh and St. Charles streets, and occupied by several Irish families, some inhabiting the damp basement, and others the upper apartments. As early as the middle of January, a case of cholera, originating on the river, was taken to this house, and died. Soon after the disease broke out among the other inmates; some six or seven of whom died in the course of ten days, or two weeks, after which, the house was abandoned. The character and habits of these persons were such as to render them fit subjects for cholera or any other disease. With, therefore, the predisposing cause already existing in the atmosphere, superadded to the bad habits of living, it is possible that the fear occasioned by the introduction of the isolated case among them may have acted as the determining cause of the disease in others.

"The next of these ill-fated locations, which at a later period became celebrated for its mortality, was on the north-west side of Green-street, between Sixth and Seventh, in a row of small two-story frame buildings. This row was densely inhabited, mostly by Irish. Here the disease prevailed violently, scarce a family escaped without one or more deaths, and some were almost entirely swept off. The only peculiarity about the situation of these houses is, that they are built near the ground, and with lots so exceeding shallow as to bring the outhouses within a few feet of the back doors.

"Still later in the season, the disease prevailed with fearful violence on the north side of St. Charles-street, between Eighth and Ninth streets, in a row of small two-story frame and brick houses, numerously occupied by mechanics and labourers, whose condition was somewhat better than on Green-street. Nearly the entire population of this block was swept off, 192 deaths occurring in the row. The street opposite has never been paved; the situation is damp, the cellars were filled with water, and the premises otherwise filthy.

"What is called 'Vinegar hill,' situated between Fourteenth and Fifteenth, and Christy avenue, and Morgan streets, was also another of these fatal localities. The inhabitants here are mostly Irish.

"The neighbourhood of Biddle and O'Fallon, and Eighth streets, as well as Biddle and Tenth, may also be enumerated among the infected districts. Here the disease raged with unmitigated severity, sweeping off hundreds. During the months of June and July, having frequently gone into these neighbourhoods to see a single case, I was detained for hours, going from house to house, and prescribing as rapidly as possible. The population of these neighbourhoods are almost entirely composed of German and Irish, who have herded together in large numbers. Near by, also, are large ponds of stagnant water, some of which cover 20 or 30 acres of ground.

"But by far the most fatal locality was that known as *Shepherd's graveyard*, (so called from the number of deaths which occurred there), being in the south-western part of the city, and embracing three squares, the former bed of Chouteau's pond. The situation of this place is low, damp, and filthy, and teemed with a population of the poorest and most destitute character. Here, as might naturally be expected, the cholera raged with unmitigated violence, and carried off its scores and hundreds. I am informed by Dr. Alleyne, who had charge of that district during the epidemic, that very many cases occurred without the slightest premonitory diarrhoea, and terminated fatally in an unusually short time.

"Besides the points above enumerated, there were several other localities in different parts of the city, in which the disease was more fatal than usual; among which may be mentioned the districts of St. George and Bremen. As a general fact, it may be stated, that the cholera prevailed most in those parts of the city in which there were the largest number of persons herded together, where the streets were unpaved, and where there was the greatest amount of filth and moisture. As a proof of this, it is worthy of remark, that there were comparatively few cases in that part of the city which is well paved, well built, and inhabited by the better class of persons; for example, from Sixth-street east to the river. But while no class or condition could claim an exemption, and while some of our best and most useful of citizens fell victims to the disease, it yet fell most heavily on the poorer classes, from their exposed condition, and especially on our foreign population. It is, perhaps, not too much to say, that at least *seven tenths* of the entire mortality occurred among the Germans and Irish."

How ill prepared the city (St. Louis) was for this dreadful visitation, we may judge from Dr. M'Pheeters' statement of its condition.

"Yet notwithstanding the warning given by its gradual approach, and the length of time thus afforded for placing the city in order for its reception, by a thorough cleansing, and by removing every source of disease, as well as by establishing and maintaining a vigorous Health Police, and preparing suitable hospitals for the reception of the indigent sick, there was manifested a singular and almost reckless apathy on the part of our authorities. The city never was in a more filthy condition, and yet no adequate steps were taken towards cleansing it, until at length public indignation was roused to such a pitch by the cruel inaction of the authorities, that mass meetings were assembled, and the people in their sovereign capacity demanded of them, in language not to be mistaken, *either to do their duty, or at once to resign*. But so afraid were they of taking responsibility on themselves, or of spending the people's money for the people's good, when they themselves demanded it at their hands, that they ingloriously shrunk from the crisis, and conferred all the power and authority which by law was vested in them, and which they only could have exercised before, to an irresponsible 'Committee of Health' composed of private citizens, who patriotically stepped forward, and did what the city authorities should long before have done. Too much praise cannot be awarded to the Committee of Health, for the prompt and efficient manner in which they discharged the duties assigned them. They commenced their operations about the 28th of June, held daily meetings, and by systematic and vigorous action, did all in their power to stay the arm of the destroyer. Temporary hospitals were established in each ward, physicians employed, and all the appliances of comfort secured for the accommodation of the poor. The city was also cleansed as thoroughly as possible, bonfires were nightly built in almost every street, and the whole city repeatedly fumigated with tar and sulphur, and other hygienic measures adopted.

"I am not disposed, however, to attribute the rapid decline of the cholera to the action of the Committee of Health, nor to any other cause, save only the withdrawal of the peculiar unknown atmospheric poison which has always given rise to it. Yet it is undoubtedly true that in those parts of the city which were most damp and filthy, and in which the greatest number of persons were crowded together, the disease prevailed to the most deadly

*Dysenteric Affections prevalent as Cholera declined.* 17

extent. This, of itself, is sufficient to show the importance of paying strict attention to hygienic regulations. As to the bonfires and fumigations, if they did any good at all, it was only by diverting the minds of the people.

"As the cholera began to disappear dysenteric affections became very prevalent. These were often troublesome, and not unfrequently fatal; the chief peculiarity which they presented was the great prostration of strength attending them, but in other respects they did not differ from the ordinary dysenteries of this climate. I am inclined to attribute this dysenteric tendency to the too rigid adherence to an exclusive animal diet, which almost every one followed throughout the whole summer, and this view is strengthened by the fact, that the disease rapidly disappeared as soon as a proper admixture of vegetable food was taken."

The following table exhibits the number of deaths which occurred during the prevalence of the epidemic:—

Months.	Cholera.	Other Diseases.	Total.	Months.	Cholera.	Other Diseases.	Total.
January - -	33	243	276	July 15 - -	58	34	92
February - -	20	221	241	" 16 - -	61	27	88
March - -	68	226	294	" 17 - -	61	23	84
April - -	131	325	456	" 18 - -	50	34	84
May - -	517	269	786	" 19 - -	36	30	66
1st Week in June	74	70	144	" 20 - -	37	29	66
2d Ditto -	139	144	283	" 21 - -	33	20	53
June 12 - -	47	12	59	" 22 - -	21	13	34
" 13 - -	65	18	83	" 23 - -	31	22	53
" 14 - -	58	10	68	" 24 - -	19	16	35
" 15 - -	62	12	74	" 25 - -	22	26	48
" 16 - -	61	13	74	" 26 - -	14	15	29
" 17 - -	69	16	85	" 27 - -	10	16	26
" 18 - -	64	15	79	" 28 - -	11	15	26
" 19 - -	74	16	90	" 29 - -	9	18	27
" 20 - -	67	35	102	" 30 - -	15	25	40
" 21 - -	85	10	95	Week ending—			
" 22 - -	95	25	120	August 6 - -	43	109	152
" 23 - -	98	27	125	" 13 - -	12	105	117
" 24 - -	118	21	139	" 20 - -	4	90	94
" 25 - -	99	28	127	" 27 - -	3	70	73
" 26 - -	94	20	114	September 3 -	4	67	71
" 27 - -	115	25	140	" 10 - -	2	64	66
" 28 - -	123	32	155	" 17 - -	1	87	88
" 29 - -	119	43	162	" 24 - -	6	74	80
" 30 - -	83	39	122	October 1 - -	3	74	77
July 1 - -	100	25	125	" 8 - -	-	69	69
" 2 - -	105	28	133	" 15 - -	2	61	63
" 3 - -	103	28	131	" 22 - -	-	44	44
" 4 - -	108	29	137	" 29 - -	-	57	57
" 5 - -	98	28	126	November 6 -	1	52	53
" 6 - -	81	27	108	" 12 - -	-	44	44
" 7 - -	89	34	123	" 19 - -	-	53	53
" 8 - -	80	27	107	" 26 - -	1	38	39
" 9 - -	101	24	125	December 3 -	2	45	47
" 10 - -	145	39	184	" 10 - -	1	41	42
" 11 - -	124	33	157	" 17 - -	2	44	46
" 12 - -	105	31	136	" 24 - -	-	31	31
" 13 - -	87	13	100	" 31 - -	-	36	36
" 14 - -	89	42	131				
				Total - -	4,568	4,041	8,609

18      *Louisville.—Medical Topography of the City.*

The following table exhibits the whole number of deaths from all diseases during each month of the year 1849, the number from cholera, and also the proportion of children of five years and under:—

*Whole Number of Deaths.*

	Number of Deaths.	Cholera.	5 Years and under.
January - - -	276	38	97
February - - -	241	20	91
March - - -	294	68	93
April - - -	456	131	146
May - - -	786	517	158
June - - -	2,440	1,799	512
July - - -	2,668	1,895	675
August - - -	436	62	208
September - - -	305	13	125
October - - -	310	5	123
November - - -	189	2	81
December - - -	202	5	62
Total - - -	8,603	4,555	2,371

In regard to the infantile mortality, as shown by the above table, Professor M'Pheeters remarks,—

"That while it is fearfully great (2,373), yet, as compared with the whole number of deaths, it is smaller than usual, being less than *one fourth* of the whole number. Yet of these 2,373 deaths among children, only 526 are reported as having taken place from cholera; from which fact it appears that while no age, sex, or condition are exempt from the ravages of this ruthless disease, it at least showed some respect to the tender age of infancy."

LOUISVILLE.

On the 1st of May cholera appeared at Louisville, and occurred almost simultaneously in several places in the district between Main and Water streets, extending east and west from Fifth to Sixth streets.

The following description of the medical topography of Louisville, prepared by my friend Professor Yandell, and inserted in the report on Public Hygiene, will be found quite complete:—

"Louisville, in Kentucky, is situated on the south bank of the Ohio river, at the Falls, lat. 38° 03' N., long. 8° 45' W. from Washington city, on a beautiful plain, 70 feet above low-water mark, stretching back, and gently declining from the river. The plateau is constituted of sand and river gravel, intermingled with a tenacious clay, and reposes upon a friable shale, analogous in character to the Genesee slate of New York. The disintegration of this slate has imposed upon the Louisville plain its peculiar features. Everywhere this rock forms a surface remarkable for its evenness; and the soil which it produces, as it crumbles under the action of the air, frost, and water, is peculiarly retentive of moisture. Ponds and slushes are abundant wherever the black slate constitutes the surface rock.





*Cases imported during the Winter did not spread.* 19

"The first houses erected at the Falls were built in the midst of ponds. Entire squares of the city are now pointed out which occupy the ancient beds of ponds, large and deep enough to float a steamboat. These have all been drained, and such collections of water are nowhere to be seen within the city limits. But south of the city, and extending 20 miles to the mouth of Salt River, is a district of country known by the ominous name of the 'Pond Settlement,' which is still but partially reclaimed. The traveller, as he pursues the public road in the direction of Nashville, sees on either hand a continuous chain of shallow ponds, until he meets another formation beyond Salt River.

"Louisville is a flourishing city. In 1780 it contained a population of only 30 souls; and in the next 20 years the number of its inhabitants had increased to but 600. In 1820 it had reached 4,000; in 1830, 10,000; now it may be stated at 50,000 souls.

"Louisville, while it stood amid its ponds, was regarded as one of the most sickly towns in the valley of the Mississippi. It was commonly called '*the graveyard of the West.*' It is now esteemed one of the most healthy.

"Intermittent fever was a regular annual visitant; and occasionally a form of bilious fever prevailed, rivalling yellow in malignity, and threatening to depopulate the town. The most fatal of these endemics broke out in the summer of 1822, after a hot, rainy season; the number of victims from it, out of a population less than 5,000, was 232. In a family consisting of 20 persons, 19 were sick at one time; and in some families every individual died. At this time only one street in Louisville was paved, and within its limits were at least eight ponds of greater or less dimensions, most of which, in the course of the autumn, were dried up, exposing foul bottoms to the sun."

From the south-east the Beargrass creek descends from the higher land and runs parallel with the river, and empties into it about the middle of the city. The mouth of this creek is foul and stagnant, and the narrow point between it and the river unhealthy.

*Cholera did not prevail in the Winter.*—Cases of cholera had been brought to Louisville by the steamboats at different times during the winter and spring months of 1849, but although the greatest apprehension existed lest it should spread through the town, no indigenous case occurred before the 1st of May of that year.

*First cases of Cholera.*—The first case occurred in a house located in a very unhealthy position below the summit of the second bank of the river, and in the immediate neighbourhood of yards that received the filthy washings of the more elevated ground above.

*Tendency of the Disease to visit certain Localities.*—The circumstance is worthy of notice, as proving the tendency of cholera to revisit certain localities, that the first cases of cholera in 1832 and 1833 appeared in the identical square in which the case above alluded to occurred in 1849.

From this period to the 25th there were 33 deaths, and about twice that number of cases.

*Paucity of Information.*—I have not the means at hand of furnishing the exact number of deaths during the prevalence of cholera in Louisville either in the year 1849 or in 1850. In regard to the



epidemic of the latter year, which is represented as the most severe visitation of cholera Louisville has ever experienced, Dr. Bell remarks,—

*Dr. Bell's Statement.*

"More rain has fallen in this vicinity in the spring and summer than in any year within our knowledge of Louisville, and we have known it eighteen summers. The temperature of the spring was remarkably low, and of the summer excessively high.

*Meteorological Phenomena.*—"The thermometer has ranged from 85° to 98°, and the air was very oppressive: but a large portion of Louisville was well prepared for such a season as this. It was clean, well drained, and has escaped remarkably well. There were spots that were neither well drained nor clean, and they suffered.

*Association of the Disease with Filth*—"In the beginning of June intermittent fever, dysentery, remittent fever, and cholera began to show themselves in low, filthy, or undrained localities. In one house a family consisting of eight persons, living in the most wretched filth on the banks of Beargrass creek, and all occupying the ground floor as lodging-rooms, was attacked with cholera, and five of them died; the others were saved by being removed from the locality. A family, however, living next door, occupying the second story of the house as lodging apartments, escaped without any sickness. Another family living in the same locality, removed to one no better. The house to which they removed was a new one with two rooms, 12 by 14 feet in size, and the plasterer had just finished his work on the rooms, and nine persons undertook to lodge in these two small rooms, with an atmosphere reeking with moisture from undried plastering.

*Excessive Mortality produced by overcrowding.*—"The removal took place on Saturday: on Sunday the wife of one of the parties was taken sick and died with cholera. Her corpse was placed in one room, and the eight survivors undertook to sleep in the other. By Thursday but one of the nine was left alive, and his life was despaired of; but, hearing of his situation, we had him removed to the hospital, and he recovered slowly. Sporadic cases of this kind continued to occur, and in the neighbourhood of piles of decaying hemp offal the cholera was especially malignant.

"The writer of this, as a member of the Board of Health, made such inspections of the localities of cholera as the arduous duties of an active practice would permit, and all aid was given to the city authorities in improving the sanitary condition of the upper end of the town."

*Appeal to the Citizens.*—"The citizens were urged to make personal inspection for themselves, because heavy rains and a high temperature were continually varying the sanitary phases of various parts of the city, and a portion that might look well under a general inspection might change materially under the influence of rain.

"On the 21th of July we received an urgent note, requesting our immediate attendance upon a portion of the lower end of the city, where the pestilence had broken out with great violence. Professional engagements prevented immediate attention to this request, but immediately after dinner, in company with the mayor, we went to the scene of disaster, and examined it thoroughly. But some hours before this, orders had been given to cover the marshy strip of ground around an old pond, north-west of the locality of the pestilence, with sand; but this order was obeyed so inefficiently that the work had all to be done over again. The following is the topography of the locality referred to.

*Dampness, Exposure to Night Air,—predisposing Causes.*

*Topography of the Cholera District.*—"Market-street, between Tenth and Eleventh streets, is the site of an old pond. Another pond, north-west of square, is still in existence, and a rope-walk is built on the eastern edge of this pond. An immense mass of refuse hemp had been thrown into the edge of the pond, and the evaporation of the water had exposed a mass of this decaying vegetation to the action of the sun. A good deal of vegetable filth, in a moist condition, was on the east side of the rope-walk. The heavy rains of the spring and summer had so saturated the ground between Tenth and Eleventh streets, that the cellars were generally full of water, and the filthy yards in that state of dampness that fitted them for the evolution of malaria under the high temperature of the present summer. The ground was so saturated with water, that upon pushing the end of a walking-stick down a few inches, water would come bubbling up. Pools of water stood under old frame houses that had no cellars, and all walls showed the marks of extreme dampness. The sewer on Tenth-street was choked so that it could not carry off the water.

*Sudden Invasion of the Disease.*—"During the night of the 23d of July, cholera commenced its ravages in the small district we have described, and on Tuesday night at 11 o'clock there had been 50 cases, and 30 deaths. The remainder died after 11 o'clock, and during the next morning. From 1 o'clock on Wednesday up to nightfall there was not a new case, but immediately after sunset there were 15 new cases. On Wednesday and Thursday nearly all the survivors were removed out of the district into healthy squares, and by the free use of sand and lime the infected square was purified. A large number of citizens laboured diligently in the cause of humanity.

*Causes of Cholera not operative in the day-time.*—"They were assured that there was no danger in day-time, but that they must not expose themselves to the night air. Of the large number that worked in the day-time from Tuesday up to Saturday afternoon, not one was attacked with cholera, but a number of those who exposed themselves at night died, thus giving conclusive proof of the malarial origin of cholera. A few of the survivors who were scattered over the healthy parts of the town died at various periods for more than a week, but no one of the families among whom they suffered any attack of cholera. We neglected to say in its proper place that on the night the cholera broke out the west wind was blowing over the decaying hemp in the edge of the pond, carrying the malaria directly upon the south side of the infected square, and the south side suffered much the greatest mortality.

*Similarity between the Source of Cholera and Malaria.*—"But it is worth of note, that the measures taken to destroy malaria checked the cholera so that it never extended beyond its first outbreak, and the epidemic was brought to a close on the second day.

"Two weeks after this, another outbreak took place towards the upper end of Jefferson-street, in a square bounded by Preston and Jackson, Jefferson and Green. An old pond stands in the middle of the square, and its shores are covered with vegetable filth. The marshy places were in a horrible condition. On the north-west corner of the square is a number of miserable shanties, and behind them, extending the whole width of the lots on which they stand, was a green pool, containing masses of vegetable filth. The south wind blew over this marsh, and the houses on both sides of Jefferson and along on Jackson-street, in the direct path of the wind, suffered severely while numbers of families on Green and Jackson, living much nearer the marshes, escaped entirely. The wind blew the malaria from them over Jefferson-street. Under the floors of the shanties we have described the water stood six feet deep, and nearly all the cellars in the square had three and a half to five feet of water in them. About 20 deaths took

under this visitation, but they were scattered over several squares. A report to the measures that had been successful in the lower end of the town was made, and they succeeded in the same prompt and efficient manner. The malarial origin of cholera has been as clearly demonstrated in this city, this summer, as if it were written, as it were by sun-beams.

*Places improved since the former Visit of Cholera did not suffer.*—"The square of which we have spoken suffered from cholera in 1833, and we described it at that time. Other squares which suffered then have been so improved, that they no longer make malaria, and they have escaped this season as well as other healthy places have. In fact there is not a dry, airy, clean square in the city that has not been as free from cholera as it has from oriental plague.

"These are facts of importance, and should impress themselves everywhere upon the public mind. Those places in Louisville, which bore the brunt of the cholera in 1833, and which have been improved so as to be dry, clean, and airy, did not have a case of cholera in them in 1849, or 1850, except a single case, in one of these improved squares. But those places in this city which were scourged in 1833, and which remain now in the state they were in then, have been scourged again in 1850. Apply these plain and practical remarks to districts or states, and their sanitary bearing is too obvious to need anything from us."

#### CINCINNATI.

*Population and Site.*—Cincinnati lies upon the left bank of the Ohio river, in N. lat. 39° 6', and W. lon. 84° 29' 30". It contains a population of 116,108 inhabitants, having increased from 56,682 to that number since 1840, when the census was last taken.

*Appearance of Cholera.*—No accurate report of the cholera as it prevailed in Cincinnati in 1849 has been written. I have been favoured by a few facts connected with its appearance by Dr. Mendenhall, which I insert as the extent of the information collected on this subject.

*First Case of Cholera.*—The first case of cholera occurred on the 27th of December 1848. The patient was taken on board of a steam-boat which ran between Madison, Indiana, and New Orleans, with vomiting and purging, and was brought in a very debilitated state to the Commercial hospital. This man had not lately been at New Orleans.

A few cases were received into the hospital from the boats during the ensuing two months, but the disease did not spread, although a few cases occurred in the house, and an occasional one on the side of the river, near the wharves, but which were not traced with accuracy.

*No Evidence of Communicability in First Cases.*—There is no evidence that any of the persons attacked were exposed to the direct influence of the disease. Professor Harrison, in his lecture on cholera, in alluding to one of the earliest cases originating in the house, remarks, "White has been in the hospital four weeks, and the disease



*The Epidemic preceded by Bowel Affections.*

seized him without any direct communication with cholera patient. The disease subsided for a brief period.

*Dr. Mendenhall's Cases.*—Dr. Mendenhall was called on the 1st of April to see a case of cholera remote from the river, and about a mile from the regular landing. The patient was a child six or seven years old, whose father was a drayman, and had bought at one of the wharves a barrel of partly decayed apples, of which his child had partaken plentifully. This child died in about 10 hours. The next day a second child of the same family was attacked, and died in 12 hours; and in two days afterwards a third one was seized with symptoms of cholera-morbus, which yielded to treatment, and the child appeared to be recovering, when it was suddenly seized with aggravated symptoms, and died in 14 hours. The family in which these cases occurred inhabited confined apartments, and lived rather poor, but were by no means destitute.

On the day of the occurrence of the second of Dr. Mendenhall's cases he was invited to see a case which had occurred in the practice of a friend. The patient, who was a poor Irishman, lived about three fourths of a mile from the cases just noticed, and further from the river. He had no knowledge of them, and had not in any manner been exposed. Cases were reported from this date as having occurred in various parts of the city, and the disease slowly increased until the early part of May, when it again subsided until the 10th of June. It then renewed its attack with increased violence, and continued unabated until the 15th of July, after which date it gradually declined until the following year.

I regret that I am unable to present specific details of this epidemic, and in the absence of more minute information, I offer the following table, showing the number of deaths from cholera:—

	Cholera.	Other Deaths.	Total.
1849 - - -	4,114 - - -	2,345 - - -	6,459
1850 - - -	1,400 - - -	1,355 - - -	2,755
	5,514	3,700	9,214

In 1849 the greatest mortality in a single month was from the 1st of June to the 16th of July; the number of deaths from all diseases being 2,475. On the 15th of July the deaths from all diseases were 154.

*Disposition to Bowel Affections preceded Cholera.*—Dr. Mendenhall states that the disposition to diarrhoea was very great during the early part of 1849, and increased as the season advanced. The first cases remote from the river supervened upon the sudden change of very warm weather for the season to quite cold weather. The following meteorological tables for the months of April, May, June, and July will indicate the condition of the weather for this period.





EXTRACTS from the METEOROLOGICAL REGISTER kept at WOODWARD COLLEGE, CINCINNATI, OHIO, lat. 39° 6' N., lon. 84° 27' W. of Greenwich. By JOSEPH RAY, M.D., Professor of Mathematics.

Day and Month.	Fahrenheit's Thermometer.			Mean height of Barometer, corrected for Capill: only, and reduced to 32°.	Wind.		Rain. Inches.	Weather.
	Min.	Max.	Mean Temp.		A.M.	P.M.		
1849.				Eng. inches.				
April 1	34	50	41.2	29.609	N.	N.		clear.
" 2	33	54	44.7	.549	E.	S.E.		fair.
" 3	39	67	55.5	.287	S.	S.	.22	variable.
" 4	50	68	55.2	29.274	S.W.	S.W.	.44	cloudy.
" 5	41	57	48.5	29.423	W.	W.		clear.
" 6	44	75	62.3	.388	S.	S.		variable.
" 7	61	76	65.5	.417	S.W.	S.W.		variable.
" 8	53	74	58.5	.476	N.	N.	.66	variable.
" 9	52	68	61.2	.240	E.	E.	1.20	cloudy.
" 10	47	62	53.3	.183	W.	W.		fair.
" 11	43	62	52.5	.527	W.	W.		clear.
" 12	42	74	60.2	.438	W.	S.W.		fair.
" 13	49	69	53.8	.289	W.	N.W.		variable.
" 14	32	43	37.7	.602	N.W.	N.W.		fair.
" 15	32	45	36.7	.310	N.W.	N.W.		variable.
" 16	28	40	40.2	.255	W.	W.		fair.
" 17	41	47	41.8	28.873	S.W.	S.W.	.18	cloudy.
" 18	32	41	37.3	29.100	N.W.	N.W.		variable.
" 19	34	50	41.2	.215	W.	N.W.		variable.
" 20	33	54	45.2	.402	N.W.	N.W.		clear.
" 21	44	62	54.2	.249	S.	S.W.	.16	variable.
" 22	53	74	62.3	.281	W.	W.		variable.
" 23	55	63	57.0	.220	S.W.	S.W.	.13	cloudy.
" 24	45	62	51.3	.418	N.	N.		variable.
" 25	43	70	55.2	.339	N.E.	N.E.		variable.
" 26	46	71	57.5	.408	N.E.	N.E.		clear.
" 27	49	81	66.5	.285	N.E.	N.E.		fair.
" 28	50	73	59.0	.203	N.W.	N.W.		variable.
" 29	46	64	56.5	.334	N.	N.		fair.
" 30	53	88	67.2	.032	S.	S.	.60	variable.
	28°	88°	52.6°	29.3109			3.65	
May 1	50	64	53.8	29.531	N.W.	N.W.		variable.
" 2	45	71	60.0	.580	N.E.	N.E.		fair.
" 3	53	87	70.3	.424	S.W.	S.W.		variable.
" 4	65	85	74.5	.378	S.W.	S.W.	.06	fair.
" 5	66	72	68.8	.331	S.W.	S.W.	1.92	variable.
" 6	66	79	70.5	.209	S.W.	S.W.		variable.
" 7	63	84	69.5	.097	S.W.	S.W.	.38	variable.
" 8	60	77	65.7	.114	N.W.	N.W.		variable.
" 9	54	74	61.7	.279	N.E.	N.E.		variable.
" 10	52	69	57.7	.187	N.	N.		fair.
" 11	46	72	59.3	.165	N.	N.		fair.
" 12	56	71	63.2	.029	E.	S.W.	.62	cloudy.
" 13	54	65	56.2	.043	W.	W.		variable.
" 14	50	71	61.0	.109	W.	W.		variable.
" 15	54	76	63.7	.123	E.	S.		variable.
" 16	56	74	62.0	.147	S.	E.		variable.
" 17	52	80	64.8	.196	N.	N.E.		variable.
" 18	53	75	63.2	.329	N.E.	N.E.		fair.
" 19	52	74	63.0	.409	N.E.	N.E.		fair.
" 20	58	80	68.3	.311	S.W.	S.W.		fair.
" 21	62	85	72.3	.189	S.W.	S.W.	.18	variable.
" 22	64	82	69.8	.060	S.W.	S.W.	.11	variable.
" 23	57	76	64.7	.177	W.	W.		fair.
" 24	52	65	55.8	.272	N.W.	N.		fair.
" 25	46	69	56.8	.294	N.E.	N.E.		variable.
" 26	49	76	64.7	.153	E.	E.	.18	fair.
" 27	61	76	65.3	.134	W.	W.		variable.
" 28	57	70	61.7	.240	W.	W.	.16	cloudy.
" 29	57	68	60.8	.345	W.	W.		variable.
" 30	56	78	66.3	.336	W.	W.		variable.
" 31	56	82	66.5	.343	W.	W.		fair.
	45°	87°	63.0°	29.2430			3.61	

Day and Month.	Fahrenheit's Thermometer.			Mean height of Barometer, corrected for Capill: only, and reduced to 32°.	Wind.		Rain. Inches.	Weather.
	Min.	Max.	Mean Temp.		A.M.	P.M.		
1849.				Eng. inches.				
June 1	57	87	71·2	29·189	S.W.	S.W.	0·36	variable.
" 2	64	82	71·8	·135	S.W.	S.W.		variable.
" 3	65	86	72·7	·145	S.W.	S.W.		fair.
" 4	63	90	74·8	·175	W.	W.		fair.
" 5	62	86	73·0	·253	W.	W.		fair.
" 6	64	83	72·8	·208	N.E.	N.E.	·07	variable.
" 7	69	86	76·0	·011	W.	W.	·08	variable.
" 8	70	82	73·2	·107	S.W.	S.W.	1·06	variable.
" 9	64	74	67·3	·085	N.	N.	·11	variable.
" 10	62	79	69·2	·268	N.	N.		variable.
" 11	63	83	71·3	·234	E.	S.		cloudy.
" 12	67	82	73·0	·212	S.W.	S.W.		variable.
" 13	69	82	73·8	·309	S.	S.		variable.
" 14	70	88	77·0	·389	S.W.	S.W.	·35	variable.
" 15	67	81	70·8	·276	W.	W.		thunderstorm.
" 16	61	78	67·8	·400	N.W.	N.W.		variable.
" 17	62	78	68·3	·464	N.W.	N.W.		fair.
" 18	60	87	73·3	·506	E.	E.		fair.
" 19	64	88	75·2	·443	S.	S.		fair.
" 20	67	92	78·2	·429	S.	S.		fair.
" 21	70	91	79·0	·388	S.	S.		fair.
" 22	70	92	79·8	·288	S.	S.		fair.
" 23	73	90	79·7	·245	S.W.	S.W.		variable.
" 24	71	88	77·0	·155	S.W.	S.W.	·34	variable.
" 25	71	84	75·7	·183	S.W.	S.W.	·14	variable.
" 26	73	86	78·2	·125	S.W.	S.W.		fair.
" 27	72	89	74·2	·179	S.W.	S.W.	·43	variable.
" 28	71	82	75·0	·145	S.W.	S.W.	·52	variable.
" 29	70	79	73·2	·145	W.	W.	1·34	variable.
" 30	70	84	74·3	·145	N.W.	N.W.	·10	variable.
	57°	92°	73·9°	29·2412			4·90	
July 1	68	80	71·3	29·151	N.	N.	1·71	variable.
" 2	60	76	66·8	·505	N.E.	N.E.		clear.
" 3	59	80	68·0	·395	N.E.	N.E.		clear.
" 4	59	79	68·3	·384	E.	E.		clear.
" 5	59	80	69·8	·506	S.E.	S.E.		fair.
" 6	66	68	67·2	·408	S.	S.	1·31	cloudy.
" 7	67	75	70·5	·339	S.	S.	·35	variable.
" 8	70	86	78·0	·292	S.	S.	2·18	variable.
" 9	74	89	81·0	·271	S.W.	S.W.	·15	variable.
" 10	76	88	80·2	·211	S.W.	W.		variable.
" 11	73	87	78·8	·288	W.	W.	·12	variable.
" 12	72	89	79·7	·457	W.	W.		fair.
" 13	72	92	81·2	·444	W.	W.		fair.
" 14	73	82	74·3	·364	N.W.	N.W.	·04	variable.
" 15	63	79	69·2	·461	N.W.	N.W.		clear.
" 16	60	82	71·0	·408	N.E.	N.E.		fair.
" 17	62	81	71·2	·299	S.	S.	·33	variable.
" 18	67	87	75·5	·273	S.	S.		fair.
" 19	68	91	79·3	·271	S.W.	S.W.	·10	variable.
" 20	72	83	75·7	·185	W.	W.	·18	variable.
" 21	70	81	72·3	·181	W.	W.		fair.
" 22	62	79	69·2	·236	W.	W.		fair.
" 23	61	84	72·5	·330	W.	W.		variable.
" 24	64	82	73·2	·290	W.	W.	1·00	variable.
" 25	71	82	74·8	·097	S.W.	W.	·40	variable.
" 26	68	89	76·7	·807	N.W.	N.W.	·04	variable.
" 27	66	90	77·2	·409	N.W.	N.W.		variable.
" 28	67	87	75·7	·297	N.E.	N.E.		fair.
" 29	69	88	77·8	·234	S.W.	S.W.	·02	fair.
" 30	68	83	69·8	·217	S.W.	N.W.	·97	variable.
" 31	57	79	67·3	·417	N.W.	N.W.		variable.
	59°	92°	73·7°	29·309			8·90	

These are the average mean temperatures of these months at Cincinnati, from the observation of sixteen years. All the mean temperatures are calculated by

De Witt's rule. (See Reports of the Registry of the University of State of New York).

April	-	-	55.2
May	-	-	63.5
June	-	-	71.2
July	-	-	75.8

Average amount of rain in these months, from sixteen years observation:—

April	-	-	3.32 inches.
May	-	-	5.02 "
June	-	-	5.43 "
July	-	-	4.58 "

#### CHICAGO.

*Topography.*—Chicago, the commercial metropolis of Lake Michigan, stands on a low sand-plain, on the western side of the Lake, in N. lat.  $41^{\circ} 51'$ , and W. lon.  $87^{\circ} 35'$ . The breadth of this flat along the lake is about four miles, whence it runs back 10 or 12 miles to the river *Des Plaines*, an elementary branch of the Illinois. When the lake stood at a level only 20 feet higher than at present, its waters overflowed this alluvial, and a portion of them flowed down the Illinois.

*Marshy Soil.*—At this time it is a savanna, abounding in marshes and low sand-ridges; traversed by the river just mentioned on the west, and on the east by the north and south forks of Chicago river or creek; which, flowing nearly parallel with the lake shore, and a short distance from it, unite within it, and form a short common trunk, which meanders through its centre, to the lake. The water in this natural canal is 20 feet in depth, and rises and falls from the force of winds upon the lake, about two feet; a fluctuation which tends to carry away the filth which would otherwise accumulate on its margins, from the houses on each side, and from the vessels which seek it as the only harbour of Chicago. From the mouth of this river there is a gradual rise of the plain, to the height of 20 feet, which may be attained by ascending the south fork of the river, to a spot whence streams sometimes flow to the east and west, on which canoes have passed from the lake into the Illinois river. The canal from Chicago to Peru now passes over that summit-level which is the lowest between the Gulf of St. Lawrence and the Gulf of Mexico, being in round numbers only 600 feet.

*Sand Dunes.*—Near the lake shore, the winds are constantly blowing a fine dark coloured sand on the margin of the plain, which, south of the town, is raised into low ridgy dunes. The town-plot, from the destruction of the coarse sub-aquatic vegetation, and the tramping of men and animals, is constantly becoming dryer and firmer. Beyond these influences, much of it inclines to marshiness; but as it is not subject to inundation, and is high enough above the Chicago and Des Plaines rivers to be drained, by a judicious system of ditching, it will, no doubt, as population increases be entirely reclaimed.

*Dr. Evans's account of Cholera.*—Dr. Evans, in his account of the prevalence of cholera at Chicago, says,—

"On the 29th of April the canal boat 'John Drew' arrived here with a number of emigrant passengers on board, who were direct from New

*Nearly confined to the Vicinity of the River until July. 27*

Orleans, by way of St. Louis, several of whom were sick, but whether of cholera or not, I cannot ascertain. They immediately left the boat.

*First Case.*—"The captain of said boat, Mr. J. Pendleton, was taken sick on the same day. He was seen by Drs. Myers, Stewart, and others. The disease soon ran into the collapse stage of cholera, and he died on the night of the 30th.

"This is the first case of which I can get an authentic account. Others were soon reported in different parts of the city.

*Uncertain Information.*—"Its greatest ravages for a considerable time were near the river; but as canal-boats were almost hourly arriving, and no pains were taken to observe them, the manner of its spread cannot be traced. It is possible that from this time a stream of '*cholera atmosphere*,' which soon pervaded different parts of the city, continued to flow in by way of the canal. Emigrants, too, were arriving by the eastern route, from the 30th of April, when the lake navigation opened, many of whom were from various parts of Europe where the cholera was prevalent, and from the quarantine at Staten Island, where it again prevailed from and after the first week of April. The health of the city, up to this time, had been as good as usual at that season of the year.

*Extreme Fatality in a Swedish Settlement.*—"That part of the city in which there was the greatest mortality, and in which scarcely an individual escaped an attack, either in the form of a diarrhoea or the more aggravated disease, is a neighbourhood of three squares in the north division, situated on the highest ground in the vicinity of Chicago. The soil is very sandy and dry. These blocks are thinly built up, and are nearly surrounded by open, vacant ground. The inhabitants are mostly of the better class of Norwegians, in moderate circumstances, who live as comfortably as the average of Americans. The three blocks numbered 332 inhabitants; of these 44 died of cholera.

*Dr. Evans's Views as to its Origin.*—"The disease had prevailed in other parts of the city for two months before this neighbourhood was affected. One case occurred in one of the inhabitants, a Swede, who was taken sick in a distant part of the city on the 5th of June, and speedily recovered. From this time, no more of the disease occurred until the 7th of July. A day or two previous to this time, 13 emigrants from Sweden, direct by way of New York and Buffalo, came into a house occupied by Samuel Arns and a family of eight persons. One of these emigrants took sick of cholera on the night of the 7th of July, and died, under homœopathic treatment, the next day.

*Alarm of the Inhabitants.*—"These Swedes had been unpacking their chests of clothing the day before the man referred to took sick. After his death, the rest of the emigrants were turned out of the house, and most of them left the neighbourhood.

"The day after the death of the Swede, there were four of the members of Arns' family taken down; of these, Mr. Arns' mother-in-law and his child died, but the others recovered.

*Spread of Cholera.*—"Andrew H. Nelson, who lived in another part of the same house, with three other members of this family, all of whom had been attending upon and rubbing the Swede, were taken down on the day he died, and survived but a few hours.

"Notwithstanding the fearful mortality in this house, up to this time the health of the neighbourhood had been good, with the above exceptions. On the night of the 14th of July, a young woman was taken ill one block south of Arns' house, on the side walk. Svend Olson, who lived in the next house to Arns, had a slight diarrhoea for a day or two, attended upon the young woman referred to until she died, was taken with the disease immediately, and died the next morning, July 16th, at two o'clock.

"Of the family in which Olson died, Mrs. Gunwald, Mrs. Olson, and a young woman, died also; one on the 23d and one on the 24th of July, and the other on the 5th of August.

"Mr. Gunwaldson, who was the captain of a vessel in the harbour, sailed at once for Michigan city, with his wife, for fear of the disease. They however, returned in health on the 25th of July, and found the disease still in their house. Mrs. Gunwaldson was taken the next day after their return, but recovered. The captain was at home when Mrs. O'son died in his house on the 5th, and leaving his wife sick of cholera, sailed again for Michigan city on the 7th, where, on the 9th, he was taken with it, and on the 10th died."

*Population and Mortality.*—Chicago contains a population of 28,209 inhabitants. The number of deaths during the epidemic of 1849 from cholera was 678. I have no specific information of a reliable nature as to the details of this mortality, or the ratio of deaths to the number of attacks. I have to regret that Dr. Evans, who has been very particular in collecting facts to elucidate the theory of the communicability of the disease, has not exhibited the same zeal in procuring that statistical information which would have enabled others to judge of its progress.

*Defective Statistics.*—The peculiar locality of Chicago, upon a reclaimed marsh, is such as to render it extremely susceptible to moisture, and it is highly probable that the squares where cholera prevailed with such fatality were dry only by comparison. Of this however, or of the condition of the localities where the disease existed, no means is at hand to reason from. One fact is evident, from the violent expulsion of the emigrants from Arns' house, *i. e.* that the family were excessively alarmed, and were consequently under the depressing influence of fear.

#### SANDUSKY.

*First Appearance of Cholera.*—On the 8th of July 1849, the cholera made its appearance, and two deaths took place upon the following day.

*Excessive Mortality.*—From this period it went on increasing in intensity and numbers, until on the 24th, 30 deaths occurred; on the 28th, 33; on the 29th, 37; and on the 30th, 33.

From this period the disease gradually abated, and finally subsided as an epidemic on the 7th of August. During its prevalence the number of deaths amounted to 307, of which 285 were produced by cholera.

The population of Sandusky on the 3d of July, numbered 5,667 persons, so that its mortality in 30 days amounted to about 18 per cent.

*Terror of the Inhabitants.*—The fearful progress made by the disease struck terror into the hearts of its inhabitants, and produced a panic, unequalled in its history, in the United States. Business was suspended, the post-office was closed, and the inhabitants fled in dismay. It is estimated that when the disease had reached its height, the number of persons in the town did not exceed 1,000.

The medical men, worn down with fatigue, were obliged to desert their posts, in order to recruit their strength. Their places were supplied by physicians from Cincinnati and Cleveland, who hastened to lend their professional aid to the sufferers.

*Professor Ackley's Statement.*—Dr. Ackloy of Cleveland, in a letter dated 1st of August, says,—

"I have but a few moments to write, but had I a whole day, no adequate idea could be given. It must be seen to form a proper estimate of the suffering.

"I have seen enough, however, to convince me that the cholera here is of a more malignant and severe form than at other places in the country. In some portions of the town, inhabited by the German and Irish population, the disease has become infectious; a cholera atmosphere or stench could be observed along the entire length of some streets, but more particularly in the vicinity of the houses where there were many sick and dead.

"I found but three of the resident physicians here, Drs. Cochran, Baird, and Lone, who are engaged with commendable fortitude in doing all they can. The medical men who have left are not to be blamed; they were worn out and sick, and in a condition that incapacitated them from rendering medical aid."

*Difficulty of procuring authentic Information.*—I have been unable to obtain any authentic account of the origin of the disease, or the peculiar circumstances attending its spread, although I have written to Professor Ackley, and appealed to him in the strongest terms of fellow-studentship, to furnish the information.

#### BUFFALO.

The first case of cholera reported by the Board of Health at Buffalo was that of a person on board of a steamboat from Chicago, and took place on the 30th of May 1849. This patient was removed from the steamer to an hotel before the character of the disease was known; from the 30th of May, when the disease began to disclose itself, to the 7th of September, when it had finally subsided, 2,505 cases were reported to the Board of Health, and 858 deaths.

*Disorders of digestive Organs prevalent before the Appearance of Cholera.*—For some time previous to the appearance of the cholera disorders of the digestive organs were unusually frequent, not only in the town but throughout the surrounding country.

*Professor Flint's Observations on the Cholera.*—Professor Flint, who carefully noted the epidemic in all its stages, and has written a very creditable report upon it, remarks,—

"The proportion of the population that entirely escaped more or less of these disorders was small. The disorders consisted in diarrhœa or looseness of the bowels, preceded and accompanied by lassitude, nausea, griping pains, sense of distension, and especially by borborismus. The latter was a uniform and striking symptom. Usually, these symptoms were speedily arrested by simple measures; occasionally they were rebellious to medical treatment. Often they persisted in returning, again and again, so soon as medical or prudential measures were intermitted. It was universally remarked, that an amount of abdominal disturbance, such as at other times would have occasioned no anxiety, and scarcely have claimed any attention, was followed by marked debility, patients recovering their strength slowly even after a slight attack.

"The second reported case also occurred on board a steamer, from Sandusky, the patient being *en route* from Cincinnati. This case was reported on June 1st.



*First Cases show no Communicability.*—"June 4th, the first indigenous case was reported by the Board. This case occurred in a part of the city distant about a mile and a half from the central street (Main street), in a north-westerly direction (in the neighbourhood of the workhouse).

"The patient was a female, and the case could have had no possible connexion (moral or physical) with the cases that had previously occurred.

"The fourth case, on the 4th of June, was on board a steamer from Chicago. The patient had been attacked with the disease before the vessel reached this port, and was quite or nearly convalescent on her arrival, so that she left town in two or three days on her journey eastward.

"The fifth case reported by the Board, was on the 8th of June. This occurred in Norton-street, a street situated near the ship canal, connecting the creek or harbour with the Erie canal. This was the *second* indigenous case.

"On the 9th of June, two cases occurred. The subjects were the wife and child of a respectable Irish mechanic, on his way from Brooklyn, L. I., westward.

"The eighth reported case was on the 11th of June, and occurred at Younglove's Tavern, on Seneca-street. This was the *third* indigenous case, and the place of its occurrence was in a part of the town opposite to that of either of the preceding cases originating in the city; nor had the patient been brought into contact with any of the patients previously affected with the disease.

"Seven other cases were reported on the same date (11th). Of these, two occurred on board a canal boat; two in Peacock-street, situated near the canal; one in Bennet street, situated in the north-easterly part of the town, remotely distant from all the places in which the previous cases had occurred; one in Norton street, where one case had already occurred; and one in Court-street, considerably removed from the sites of the preceding cases.

"On the 14th of June, seven cases were reported. Three of these occurred in Rock-street, a street situated near the canal, and of a character analogous to that of the Five Points in the city of New York. One case occurred in Mohawk-street, a street quite distant from any of the others in which the disease had existed. One case at the American Hotel, in the centre of the city; and in two cases the residences of the patients were not stated. These seven cases occurred between the 11th and 14th of June, the Board of Health holding sessions only on those days.

*Increase of the Disease.*—"Between the 14th and 20th of June, (the Board meeting again on the latter date), six cases had occurred. Of these, five were in Rock-street, and one in Fifth-street, a street also distant from those in which the previous cases had been developed.

"On the 23d of June, at the next meeting of the Board, six cases were reported. Of these *one* case occurred in Erie-street, *one* in Green-street, *one* in Rock-street, *one* in Clinton-street, and in *one* the street was not stated. These localities are separated from each other by distances of from a quarter to half a mile, with the exception that Rock-street intersects Erie-street. The residences of the patients in the reports are not given with more exactness than the names of the streets.

"On the 25th of June, five cases were reported; *one* in Rock-street, *one* in Erie-street, *one* on corner of Eagle and Main streets (a new site), *one* on the steamer Globe, and *one* on the steamer Niagara.

"From the date last mentioned, June 25th, the epidemic continued to increase. The Board of Health held daily sessions, and issued daily bulletins, the number of cases steadily increasing from week to week (with daily fluctuations), up to July 24th, when a larger number of cases were reported than on any other day during the existence of the epidemic. On that day the number of cases reported to the Board was 103, of deaths 32. From this date the prevalence of the disease decreased, the number of cases steadily and gradually diminishing on each week, up to September 7th, when the Board ceased to issue their daily bulletins. Some cases have since occurred, and at

the present time (September 29th), the disease is not entirely extinct. \* As an epidemic, however, it cannot now be said to prevail, all apprehension of the disease in the public mind has disappeared, and business has again resumed its usual activity."

*Favourite Localities of Cholera.*—Although the disease manifested itself in almost every part of the town, yet it appeared to linger in its favourite bounds among the most insalubrious districts, and chiefly selected its victims from the poor and destitute. The labouring classes, and more particularly the foreigners among these classes, were those most frequently attacked.

*Population most susceptible.*—"The parts of the city where cases were most numerous, are confessedly less salubrious than those in which the disease prevailed in a less degree, and, at the same time, contained a larger proportion of the classes of population furnishing (as statistics show) the larger number of victims. The sections in which the epidemic prevailed most, and with the greatest virulence, were,—1st, streets in close proximity to the canal, densely inhabited, and abounding most in poverty and vice; 2d, a part of the city, known as the Hydraulics, in which miasmatic affections are somewhat rife, and the population, generally speaking, not of a character to be peculiarly exempt from an epidemic disease; and 3d, in a part lying in a north-eastern direction from the centre of the city, in which the population consists almost wholly of German labourers.

"The situation and climate of Buffalo are eminently salubrious. The greater portion of the city lies on a considerable elevation above the level of the lake. The soil generally is aluminous. A portion of the city, however, designated the 'flats,' on the borders of Buffalo creek, is low and marshy, and liable to inundations from the action of westerly winds. In the latter locality miasmatic emanations are not entirely extinct.

*Favoured by Humidity.*—"The air is pure, and, notwithstanding its proximity to the lake, by no means humid; fogs are not infrequent. The extremes of heat and cold are not great, although the alternations of temperature are frequently sudden and considerable. During the last 14 years, (the period of our residence), no epidemic disease has prevailed with much severity. During the prevalence of epidemic erysipelas and puerperal fever in numerous sections of the country, this place did not entirely escape, but it suffered far less than other places even in the immediate vicinity. Scarlatina, during the period mentioned, has never prevailed extensively, or with malignity. Typhus or typhoid fevers have never been rife.

*General Health of Buffalo.*—"The ratio of ordinary diseases to the population, in so far as we may judge without any precise data for comparison, has been less than in eastern towns, for example, Boston, Mass. During the former visitation of epidemic cholera, however, it suffered severely for two seasons, viz., 1832 and 1834. In the recent epidemic it may be said to have suffered severely. The disease did not prevail to the same extent, or with as much fatality, as in some other western towns, viz., Cincinnati, St. Louis, and Sandusky, but Buffalo comes next in order to these places; a greater number of cases in proportion to its size having occurred than in New York, Boston, and the intermediate towns. Now the question arises, What bearing have these facts on the etiology of the disease? We take it for granted that the existence of some epidemic agency in the production of cholera is sufficiently established; in other words, that a special cause, irrespective of endemic causes, is involved in its development. The latter, however, may play an important part in originating and diffusing the disease; but their operation is auxiliary, and secondary to the essential cause, i.e., the cause from which the disease receives its essential character. The important agency of endemic causes is shown by the fact, that the disease is so generally

\* Oct. 10.—No cases have come to our knowledge since the 29th ultimo.

confined to a small area,—prevailing in cities especially, and frequently in limited sections of the city. It is not to be supposed that the special epidemic influence elects these situations to the exclusion of the vicinity, but it is there that auxiliary causes exist, adequate, by co-operation with the special cause, to give to the latter requisite efficiency for the production of the disease.

*Local Circumstances operating to induce a Spread of the Disease*—"In view of the salubrity of the climate and situation of Buffalo, we must look for some peculiar local circumstances operating in conjunction with the epidemic cause, in order to account for the prevalence of the disease. These circumstances probably relate to the character of a portion of the population of the city. The position of Buffalo is such, that it contains a large floating population, consisting of emigrants from all countries in transition to places farther westward, and new comers of all kinds, seeking for occupation and new homes, in addition to the usual population of the labouring class, the destitute, and the devotees of vice.

*Emigrant Population.*—"The class of labourers were greater than usual the present year, in consequence of the public works occupying a large body of men, mostly Irish and Germans. The various kinds of population just designated are peculiarly exposed to causes of disease. They are crowded together, many have recently endured the confinement and privations, and sickness of a voyage across the Atlantic; not a few are impoverished, and the majority are desirous of consulting the strictest economy in their mode of living; they are strangers without homes, and often depressed by disappointments and anxieties incident to their position. Adding to these circumstances, ignorance, recklessness, intemperance, and other vices, which will apply to a considerable number of the persons referred to, and we have sufficient reasons for regarding them as favourable subjects for any epidemic disease like that under consideration.

*The floating Population for the most part the Victims*—"The disease prevailed chiefly among the floating population of the city. We presume that we do not exaggerate when we say, that nine tenths of the cases were among the classes just enumerated. Nevertheless, a small proportion of the cases were among a different order of our population, to whom none of the foregoing considerations are applicable."

The subsidence of cholera was marked by a tendency to dysenteric affections, which presented a strong disposition to prostration. The pulse in most cases became frequent, the sinking of the vital forces very great, hæmorrhage occurred from the bowels, and in many instances a low delirium supervened, from which it was extremely difficult to arouse the patient.

*Mortality from Cholera.*—The whole number of deaths from cholera in 1849 was 858, or 1 in 46 to the native population.

#### THE PREVALENCE OF CHOLERA IN THE CITIES ON THE ATLANTIC SEA-BOARD.

##### NEW YORK.

*The Effects of its rapid Growth visible in irregular Streets.*—In its early history New York underwent a very rapid transfiguration from a quiet Dutch village to a bustling commercial town, without being prepared for the change, or scarcely realizing it until it had been in some degree effected. The consequences of this change without preparation are to be found in the narrow, crooked, and irregular streets

which run in all directions, except at right angles, in the lower and older parts of the town ; and the irregularities established by accident have since been preserved from necessity.

*Failure of proposed Remedy.*—Some attempt was made to remedy this defect after the great fire of 1835, but, like the scheme proposed by Sir Christopher Wren for London, it was not carried into effect.

*Large Amount of Disease dependent on bad Ventilation.*—The evils entailed upon New York by this want of plan in its inception are manifest in the large number of diseases arising from defective ventilation, and consequently, a confined atmosphere, although in estimating its salubrity great allowances should be made for the poor foreign population cast upon its wharves in a state of poverty and disease, and which serve to swell to a great extent its bills of mortality.

*Overcrowding of Population.*—The immense business transacted in that portion of the city lying in immediate proximity to the junction of the two rivers, has rendered property extremely valuable, and induced an overcrowding of population to an alarming extent. There are, however, particular localities which enjoy an unenviable reputation above all others for uncleanness and impurity of atmosphere, some of which are thus spoken of by Dr. Griscome :—

*Dr. Griscome's Account of the overcrowding of Population in New York.*

"To enter into minute details of the various localities distinguished for their fertility of disease, and its attendant evils, would be somewhat out of place here, and from their extent impossible in such a sketch ; they exist in all parts of the city. At its very maritime threshold, the state of the air is rendered very disagreeable and unwholesome, from the manner in which some of the quays and slips are kept. This evil will not, however, be entirely remedied until the street manure ceases to be deposited and shipped as at present.

"The city authorities, after having understood the necessity of a constant circulation of air in every street and place where there are dwellers, cannot but condemn such narrow thoroughfares as Hague-street, and those in its neighbourhood.

"In such places the air is always, in calm weather, in a state of stagnancy. These lanes are, however, comparatively healthful, when considered in connexion with the narrow filthy alleys and *culs de sac* off some of the principal streets in the city. Many persons have, indeed, walked through the city a lifetime, without being aware that such places exist at all. These must, however, look beyond plaster-of-Paris and beautiful brick facings. To obtain a correct notion of the swarms of human beings that, coney-like, have taken up their abodes in holes of the earth, or congregate in garrets, they must muster the fortitude necessary to wend their dreary, and perhaps dangerous, way up some filthy, dark, winding stair, or, mole-like, burrow through the mazy and gloomy hall of a group of cellars, all the while stumbling over chairs and children, and wading through broken crockery-ware, vegetable refuse, and unmentionable filth ; they must trace the monster to his den,—the last enemy of the human race to his hiding-places.

*Condition of the Old Brewery.*—"They must explore even the 'Five Points' itself, that profoundest of all sinks of moral and physical pollution, which sends forth from its pandemonium, in the shape of the 'Old Brewery' (which is a moral brewery still), the agents who perpetrate the 'stratagems and spoils' there concocted, and bespatter the reputation of the whole city in the eyes of the world.

*Filthy Condition of the Five Points.*—"A few specimens of these places would, perhaps, throw considerable light on them all. For this purpose, let

## 34      *Disgusting Condition of the "Old Brewery."*

any one (particularly if sceptical as to the alleged evils of impure air), visit some of the courts opening into the 'Five Points,' or even into that great and wealthy mart Pearl-street. We shall give him two, entered at random, by a person interested in such examinations, and which are in a sanitary condition less objectionable than many others in the same quarter, viz., those adjoining 476 and 496 Pearl-street. The entrances are of considerable length, scarcely admit two persons together, and terminate in areas containing one or more privies, which occupy the centre, and are but a few feet from the doors of the houses, and, of course, immediately below the windows. In each case they must be resorted to by several hundreds of people. At the entrance a stench, insufferable to all, except those habituated to it, meets the visitor; this increases in intensity until the inner area is arrived at, when, from the height of the surrounding houses, and the consequent accumulation of the rays of the sun, very often nearly vertical, and almost torrid, he may well imagine himself in the funnel of a great chimney-shaft, erected for the purpose of carrying off immense volumes of the most noxious gases, not set free by artificial lamp or fire, but by the sun itself.

*Wretched Condition of the Inhabitants.*—"The appearance of the people and their houses (if they deserve that name) are in good keeping with the atmosphere. The doors and windows of their squalid apartments are closed against the foulness of the external atmosphere until it is made worse within, when they are thrown open to let the still fouler air out.

"Thus the inmates live from week to week, and thus they die of fever, scrofula, debility, marasmus, and many complaints unknown to the better aired and housed. These are true specimens, of which there are endless modifications in every ward within the municipal boundaries, but especially in the locality of the 'Five Points,' and extending along Cross, Orange, Bayard, and Mulberry streets.

*Description of the Old Brewery.*—"Perhaps no object in New York has proved more interesting, to both stranger and citizen, than this said 'Old Brewery,' or distillery, or whatever it may have been intended for. It would seem as if Satan had decided that the speculation of brewing or distilling, though generally very profitable to him, was far inferior in this respect to another higher game which could be easily put in operation, and that, altering his intention, the building was fitted up for dwellings, divided into as many compartments as possible, and let to those whose finances, inclinations, or avocations, the building peculiarly suited. Along each side of the building a narrow alley\* runs from Cross-street, terminating in small courts in the rear. Additional doors have been broken out into the alleys, and a peep into one or two would convince the most resolute that he was in no small danger, not only of losing his health, but also of personal violence, if he has already escaped. The census of this model school of mysteries, miseries, and vice, is rated to be at times 300, that number having, it is said, actually been counted in it. In any and every aspect this is a most disgraceful spot, and contrasts very strongly, and seems strikingly inconsistent with our boasted *model republic*, which has no doubt been often alluded to as such by many a mayor and alderman, who may have walked past the Five Points without the *Brewery* ever once catching their eye, or suggesting any thought of improvement, which should long ago have been enforced.

"As to the number of rooms in the Brewery we have no means of ascertaining, but its low situation, and its external appearance, with the number of occupants compared with its size, speak loudly enough for its state of ventilation. There seems only to be one privy, which occupies the centre of the small area of the court; but of its state, and the condition of the atmosphere around it, for a considerable distance, the reader will have no objection to waive a description. It would seem that the influence of habit, and the self-fortifying principle inherent in the human constitution, in a great measure, shields those miserable and degraded wretches who inhabit such

\* One of them is usually called "*Murdering-alley*."

*"Orange Street"—the Spot in which the First Case appeared. 35*

places from immediate dissolution, while the pestiferous atmosphere gradually extinguishes all the better attributes of their nature.\*

"There are, however, about the Five Points, and indeed many other parts of the city, equally as great eye-sores to all interested in the advancement of society as the house referred to, except, perhaps, in the particular of absolute population. In the lower part of Washington-street, and in the narrow streets and lanes in its vicinity, there are, during the emigration season, many suitable counterparts to the house in Boston. As many as two dozen of the adventurers often sleep in an apartment not more than 2½ feet square, the air being in a worse state, if possible, than in the ships. From these houses many emerge as paupers, their pockets emptied, and their frames debilitated, unable to work, and often even unable to beg."—*Griscome on Ventilation.*

After the subsidence of the cholera at Staten Island in December 1848, no new cases occurred in New York until the 11th of the following May.

*Appearance of Cholera in May.*—One of the medical men attached to the New York dispensary was called upon on that day to visit two patients at No. 20, Orange-street, whose symptoms led to the belief that they were labouring under an attack of Asiatic cholera, under which disease they rapidly sunk, and died in the course of a few hours.

These cases were followed by others of a similar character, which confirmed him in his belief of the nature of the disease, and induced him to communicate the fact to the Board of Health, who directed Dr. Buel to examine the disease and premises, and report the result of his observations to the Board.

Dr. Buel thus describes the revolting spectacle this locality exhibited on this and subsequent visits :—

*Dr. Buel's Account of this Locality.*

"This place having been, so to speak, the birth-place and natal soil of the recent epidemic, is, perhaps, deserving of a moment's notice. It will be found no matter of surprise that here cholera selected its first victims. A more befitting birth-place could hardly be found within the limits of this or any other city.

*First Cases.*—"No. 20, Orange-street, lies about 30 or 40 yards in a southeasterly direction from the 'Five Points.' The entrance to the rear lot is gained by an opening scarcely two feet in width, or more than six feet in height, pierced through the front house. Passing through this a distance of 40 feet, you reach the rear lot, on which are two old and ruinous wooden tenements: one a prolongation backwards of the front house, the other standing across it and at right angles. The adjoining house, an extension backwards in the same manner, thus cutting off almost completely all ventilation or admission of fresh air. The small area left unbuilt upon is covered with black pools of filthy water.

"The apartment where the first cases occurred is a basement or cellar in one of these buildings, sunk entirely below the ground level. The room is about 10 or 12 feet square; the door had fallen from the hinges; the sashes

\* The following paragraph is quoted from the "*Boston Bee*,"—"Life in Boston.—There is in Oliver-street a house containing 13 rooms, which has for regular occupants 93 persons." A New York editor adds, "The '*Old Brewery*'—new edition; but it has been seen that the Boston establishment is still deep in the shade of our Old Brewery; yet who would have imagined that lodgings would ever be so dear, and mortals so extravagantly gregarious in this land of bricks and timber?"

of one or two small windows were without glass. There was not in the room, bed, chair, or table, or a single moveable, except two empty barrels; the door, removed from its hinges and laid across these, formed the only substitute for a table. At my first visit, on the 16th of May, five human beings, one man and four women, lay upon the floor in different stages of cholera. There was nothing under them but mud and filth, and nothing over them but a few rags of the filthiest condition. It is not easy to conceive of human beings reduced to a more abject condition. Civilization and a great city could only afford a parallel to this scene.

*Abject Condition of the Inmates.*—"They were lower than savages, because the latter would, at least, have the sky above them, and the pure air of heaven to breathe. They were actually lower than brutes.

*Intemperance and Cholera—their Association.*—"These people constituted the second crop of cases. Those first attacked had died previously. Their death had been observed by a 'wake,' and extensive potations of villainous whiskey. The orgies were kept up during the whole night: and all those now sick, with a number of others, were assisting at this 'wake.' Indeed, the subsequent cases, for two or three days, were mainly those who were at the 'wake.'

"On the morning of the 17th, two of the five mentioned died. The survivors, together with some new cases, in all seven, were removed to a temporary receptacle at 127, Anthony-street; four of the seven died before the 18th. Those who survived, with some others, were transferred on the 18th to the building afterwards known as Centre-street hospital.

*Old Brewery Patients.*—"On the 19th, no new cases were admitted. On the morning of Sunday, the 20th, two women were brought to the hospital from the 'Old Brewery,' situate about 100 yards west of 20, Orange-street. Both were labouring under the strongly-marked symptoms of the most malignant Asiatic cholera. Both died in three or four hours after admission.

"On the 21st and 22d, five cases were brought in, all originating within 100 yards of the old locality. On the 23d, no new cases. Previous to the 24th, it is not known that any cases had originated at any place distant more than 100 yards from the original locality.

*Confined Locality of the Disease for the first 14 days.*—"In 14 days from the commencement, the pestilence had not extended itself beyond this distance, nor had it numbered more than about 20 victims: all of these, with two or three exceptions, were females of the lowest and most abandoned character, living in beastly filth and intemperance. It is worthy of remark, that during the whole of this period, the temperature was cool, and a fire was necessary for the comfort of the patients and their attendants.

*The Disease extended itself to new Localities.*—"On the 24th, a patient was brought in, found at the corner of Stanton and Clinton streets, in the 17th ward (probably a mile), in a north-easterly direction from the original locality. During the subsequent week, ending with the 31st May, the cases were still mostly confined to the old neighbourhood. On the 31st, one patient was brought from Thames-street, half a mile in a south-westerly direction.

*The Disease increased with the warm Weather.*—"During the first seven days of June, the weather became warm, and the disease spread rapidly in all directions. Within this period 70 cases were received into the hospital, being double the whole number admitted during the whole previous time the hospital had been open. It had shown itself in First, Second, Third, Fourth, Fifth, Sixth, Seventh, Eighth, Ninth, and Fourteenth wards, at least, and, perhaps, in some others. The number of patients admitted to Centre-street hospital was quite beyond its limited capacities, and it was crowded to a most uncomfortable and dangerous extent. The mortality during this period was greatly increased by this overcrowded condition, as is evident from the official report to the Board of Health. Subsequently, by the opening of William-street hospital, and of additional apartments in Centre-street hospital, the per-centage of deaths was greatly reduced.



"At the end of the first week in June, or about 28 days from the appearance of the first case, the pestilence had become pretty extensively and generally diffused over the city. At the end of the third week in July, or about 72 days from its first appearance, it had arrived at its 'culminating point'. Its increase was very gradual, uniform, and progressive. Its decline was of a similar character, but more rapid than its increase.

*Maximum Mortality.*—"The maximum of weekly mortality in the city, viz. 1,409 deaths, was reached on the 21st July, 72 days from the appearance of the first case. On the 29th September, 60 days from the period of greatest mortality, 132 days from the first case, it had fallen back to the mortality at the commencement.

*Favourite Cholera Localities.*—"There were in the city a number of particular localities, in which the pestilence raged with extraordinary malignity. These were in the neighbourhood of the 'Five Points,' the lower part of Washington-street, in the First ward, the streets and avenues in the Sixteenth ward lying near the North river, and in the north-eastern section of the city, in the Seventh, Tenth, Eleventh, and Thirteenth wards.

*Local Causes of Cholera.*—"This unusual malignity was produced in part by local causes, and in part by the character of the population. In the Sixth ward, occupied to a considerable extent by a filthy, degraded, and vicious population, and in which abound places similar in character to that described at the commencement of this paper, it can be no matter of surprise that the pestilence devoured hecatombs of victims. The section of the First ward where it raged most severely, was crowded with newly-arrived German emigrants, living in habits of personal and domestic filth, and fed upon insufficient and unwholesome diet.

*Nuisances in the Sixteenth Ward—Agency of stagnant Water, and Collection of Animal Refuse in developing the Disease.*—"In the Sixteenth ward the population was less crowded, but there were in operation local causes which sufficiently explain the mortality. Pits and pools of stagnant water abound. Numerous horse-killing and bone-boiling establishments send forth their putrid miasmata. These, with glue, starch, and soap manufactories, produce a combination of villainous and disgusting odours, without a parallel. It is true that some of these horrible nuisances were for a time suppressed, but not until the pestilence had swept over the entire neighbourhood with the besom of destruction.

"In the north-eastern section of the city it is not known that any local causes existed, but the population was largely composed of German and other emigrants, whose habits of life, nature of diet, &c., eminently dispose them to become the victims of an epidemic.

*Exemption of the better Parts of the Town from the Epidemic.*—"Those portions of the city occupied by wide and airy streets, and inhabited by a population whose circumstances and habits of life, by reason of diet, ventilation, and cleanliness, are favourable to health, enjoyed almost a complete exemption from the ravages of the pestilence."

*History of first Cases show that they were not exposed to the Influence of Contagion.*—"Great care was taken to ascertain the history of the first cases for some time previous, and on the most rigid scrutiny it appeared that they had occupied the residence in which they had been attacked for weeks, and had had no communication with persons labouring under the disease, nor was there at this time any other evidence than that presented by these cases of the presence of the disease in the city.

*Sanitary Committee.*—"The Sanitary Committee of the Board of Health, accompanied by the mayor of the city and the medical council, consisting of Drs. John B. Beck (since deceased), Joseph W. Smith, and Samuel W. More, whose eminent medical ability was actively employed for the benefit of the city during the continuance of the

epidemic, on the 21st May visited the "Five Point" region with the view of satisfying themselves concerning its actual condition, and thus speak of it in their report:—

*Their Visit to the Five Points.*—"It is not the intention of the committee to describe what they witnessed.

"To be appreciated the place must be seen. Suffice it to say that the exhibition of human degradation and wretchedness which presented itself was truly appalling. To those of the committee who visited it for the first time, it seemed almost impossible that such a state of things could exist in any portion of our city. In addition to what had been done previously, renewed orders were now given, and efficient measures adopted to purify the place.

*True Remedy to be found, in the razing of the Five Points.*—"The truth, however, cannot be concealed: the place itself is incapable of proper purification, and will continue to remain so until it is razed to the ground, filled up, and suitably rebuilt. To accomplish this will require Herculean energy; our city, however, is equal to anything, and the committee do not know of any subject to which its united interest and philanthropy could more legitimately and advantageously be directed."

*Erratic Course of Cholera.*—From this point, which, so far as the closest investigation is enabled to determine, originated the disease; it travelled irregularly and apparently without any connexion over various other districts of the city. On the 24th of May, it appeared in the Seventh ward; on the 28th, in the Second. By the 31st, it had extended to the First and Fourth wards. On the 4th of June, cases occurred in the Eighth ward, and on the following day, in the Fourteenth, Seventeenth, and Eighteenth wards. On the 6th it appeared in the Ninth; and on the 23d, in the Sixteenth ward.

The intensity of the disease was not commensurate with its early appearance, for in the Sixteenth ward, which escaped for nearly one month, it prevailed with such virulence as to cause 778 deaths, which, in proportion to its population, suffered to a greater extent than any other portion of the city, except the fated Sixth.

*Poverty and Wretchedness of the Victims of Cholera.*—The inhabitants of those parts of the town where the disease was most fatal, were universally poor and destitute; wretchedly clad, miserably fed, and worse lodged,—with constitutions broken down by excessive intemperance, and too frequently by the most grovelling debauchery.

"Table showing the Number of Deaths by Cholera during the Year 1849, arranged according to the Places of Nativity.

Nativity of Cholera Patients.	
United States -	1,627
Ireland -	2,219
Germany -	583
England -	247
Scotland -	69
British America -	39
France -	23
Wales -	13
West Indies -	9
Sweden -	8
Denmark -	6
Holland -	6
<b>4,849</b>	
Brought forward -	4,849
Switzerland -	5
Italy -	4
Prussia -	3
Portugal -	3
Russia -	3
Norway -	3
Belgium -	2
Poland -	2
Spain -	2
Africa -	1
Unknown -	194
<b>Total -</b>	<b>5,071</b>

### *Hidden Nuisances.—Bone-boiling Establishments. 39*

"The subjoined view is a comparative record of the monthly returns of deaths by cholera for the three periods in which it prevailed as an epidemic.

Year.	May.	June.	July.	August.	September.	October.	November.	Total.	Ratio of Deaths to Annual Mortality.	Ratio of Deaths to Population.
1849	35	775	2,625	1,451	161	16 <sup>n</sup>	7	5,070	1 in 4'68	1 in 88'73
1832	-	-	1,797	1,202	451	63	-	3,513	1 in 2'93	1 in 65'46
1834	-	-	-	421	507	43	-	971	1 in 9'25	1 in 278'06

"It will be observed that the total number of deaths in 1849 greatly exceeds that of 1832; yet the ratio of deaths in 1832 was nearly double that of 1849. This was also true to the ratio of population."

From the former table it appears that of the 5,071 deaths from the disease, 3,250 were foreigners.

In addition to the want and misery which brooded over their dwellings, the victims to cholera were rendered still more susceptible to the morbid agency of the disease by the various nuisances hid among their densely populated neighbourhoods.

Dr. Geer, the city physician, thus speaks of these :—

#### *Dr. Geer's Opinion of hidden Nuisances.*

"The cholera first appeared in the Sixteenth ward, June 23d. On this day a case occurred in Thirty-third Street, near the Tenth Avenue, and on the 9th of the same month the disease became epidemic from Twenty-fourth to Fortieth Street, and from the Eighth Avenue to North River. On the elevated ground in the neighbourhood of Thirty-fifth Street, from the Ninth Avenue to the North River, it raged with great violence. In many instances eight and ten persons from one house were seized and died of the disease. The cholera was equally malignant in Thirty-third Street, near the Tenth Avenue, and continued epidemic in these localities until the latter end of August. In the Twelfth ward, the first case of cholera occurred on the 8th of June, in Forty-second Street, between the Ninth and Tenth Avenues. The disease in a few days was disseminated over the whole ward, and continued with unabated violence for a period of nearly two months. At Haerlem and Manhattanville the first cases occurred about the middle of July. As many as 30 deaths occurred, and about the middle of September the disease here was entirely extinct.

"The cause of its long and malignant character in this part of the city can only be accounted for from the fact that there were found many filthy localities spread over the surface which was occupied by the epidemic. Several bone-boiling establishments were discovered, with immense piles of bones scattered around, while heaps of the same were found with meat attached, and all in an advanced state of decomposition, and exhaling a stench which was horrible in the extreme. These, together with manure heaps, pools of stagnant water, and a horse-killing establishment, were believed to contribute much towards prolonging the epidemic character of the disease; in consequence of which the sanitary committee were obliged to close these establishments until the disease ceased to exist among us."

The city inspector's remarks on this subject are equally pertinent.

#### *Bone and Flesh Boiling Establishments.*

"Distributed throughout the Twelfth and Sixteenth wards, and hid away in densely-populated neighbourhoods, are shanties and outbuildings, in which

are boiled up together in large cauldrons, the refuse of the streets and markets, the bones and scraps of animal substances found about these places, and every particle of dead and putrefying animal matter that the scavengers of the city collect in hand-carts and bags, by raking the gutters and purlieus of offal and filth. The carrion of horses and oxen, cows, hogs, rancid fat, bought or begged at the markets, are all thrown into the cauldrons and boiled for various purposes of traffic. From these places the most intolerable stench arises, which mingling with the atmosphere, is brought into the dwellings of the neighbourhood, their sick rooms and nurseries, in a greater or less state of dilution; so dense and persistent is the stench created by these places, that I have been led, when ferretting out their secluded abodes, for a long distance with no other guide."

*Effect of the closure of these Establishments.*—"During the prevalence of the cholera I closed such of them as could be found, and the result was another evil. The dead horses and cattle were now thrown into the rivers, and there remained bloating and festering in the sun and heat, floating, with the ebb of the tide out of the slips, and returning with the flood to some other place along the wharves. In this manner the same carcass would lie around the city for weeks; some of them were found on Long Island beach, from whence came frequent complaints. Thus, in removing one evil, something must be done to prevent another equally great."

Whether the circumstances found to prevail in the neighbourhood of Orange-street and the Five Points are considered as originating the disease, or as mere adjuncts in favouring its development, the lesson taught is equally important and pertinent.

"The following Table exhibits the weekly mortality from Asiatic cholera, and all other diseases of the stomach and bowels, with the mean morning temperature of each week during the prevalence of cholera.

*Weekly Mortality.*

Week ending—	Deaths by Cholera. Asphyxia.	By other Diseases of the Bowels.	Total by all Bowel Diseases.	Mean Morning Temperature.
May 19 - -	1	28	29	55
" 26 - -	13	24	37	61
June 2 - -	29	40	69	59
" 9 - -	121	60	181	65
" 16 - -	145	38	183	78
" 23 - -	152	59	211	74
" 30 - -	286	103	389	63
July 7 - -	317	98	415	65
" 14 - -	484	196	680	78
" 21 - -	714	297	1,011	71
" 28 - -	692	278	970	73
August 4 - -	678	266	944	71
" 11 - -	423	260	683	75
" 18 - -	387	265	652	71
" 25 - -	233	228	461	72
September 1 -	171	204	375	74
" 8 - -	94	145	239	66
" 15 - -	36	124	160	62
" 22 - -	21	107	128	65
" 29 - -	11	94	105	60
October 6 - -	16	63	79	55
" 13 - -	3	60	63	50

By a comparison of the mortality from cholera in 1849 and in 1832 in New York, it will be seen that the recent epidemic was less severe and alarming than in 1832, and did not exhibit the same intensity as in the cities in the interior valley of the Mississippi.

*Relative Fatality of the Disease in 1849, and former Epidemics.*—By examining the city inspector's table (formerly inserted) the number of deaths from cholera in 1849, 1832, and 1834, it will be seen that while the above-mentioned table shows that the actual number of deaths from cholera in the year 1849, was considerably greater than in either of the two former years, in which it prevailed as an epidemic, yet the ratio to all the deaths amounted to nearly double in 1832 to that of 1849, and the proportion to the population (450,000) to one third more. To this fact, which is pregnant with importance, I shall have occasion to recur again, and will now only remark in passing, that notwithstanding the existence of the bounds desolated by cholera in 1849, New York had in the interval, between the two former and the last epidemics, undergone a considerable change for the better.

*Change in the Condition of the City.*—With the increase of its population a large proportion of the better class of its resident population had retired to the upper part of the town, and occupied more spacious residences, upon wide and airy streets.

*Advantage of a full Supply of pure Water.*—The introduction of the Croten water likewise exerted a decidedly beneficial influence in all parts of the town, and contributed largely to the prevention of the rapid spread of the disease.

*Meteorological Phenomena.*—The meteorological condition of the city was likewise unfavourable to the dissemination of cholera; and although under influences ever present in the warm season, cholera was developed in the purlieus of the "Five Points," yet with the condition of the atmosphere, as developed by the thermometer and barometer, its dissemination was necessarily confined and limited. These positions, if true, and I shall have occasion to refer to them again, cannot demand too close an examination.

#### ALBANY.

*Topography.*—This town, which is the capital of the state of New York, is the oldest city in the United States. It lies upon the Hudson river, 145 miles above New York, in 42° 39' 3" N. lat. and 73° 32' W. longitude. The lower portion of the town skirting along the river occupies a low alluvial flat, varying from 15 to 100 rods in width, terminated on the west by an abrupt hill of clay and sand, which rises 220 feet in a mile, and is terminated by a sandy plain which stretches, without much variation of prospect, to Schenectady, a distance of 16 miles.

*Commercial Position.*—The position of Albany, in the great thoroughfare between New York and the central part of the State, makes it a place of considerable travel and trade. To accommodate the latter a large basin of many acres in extent has been built, and much of the alluvium on the bank of the river has been reclaimed by filling up.

*Scenery on the Hudson river.*—The approach to Albany by means of the Hudson, from New York, is through a great variety of the most

picturesque scenery, among which the lofty precipices of columnar basalt, known as the Palisades, and the lofty gneiss hills at the high lands, are not the least conspicuous near Albany.

*Helderberg Mountains.—Geological Phenomena.*—The Helderberg hills present a front of limestone of five or six hundred feet in thickness, which formation continues to prevail, constantly diminishing in thickness through the valley of the Mohawk, and so on to the western part of the State, until it can scarcely be recognized at the Falls of Niagara.

*First cases of Cholera.*—The first case of cholera occurred on the 5th of June 1849, upon the corner of Broadway and Orange streets. The man who was the subject of the attack, from which he recovered, had not been in any place from whence he could have derived the disease, and Dr. M'Naughton believes the "disease originated with himself." The second patient was a man at the Northern hotel, not more than 30 feet from the residence of the first person attacked. He had been labouring under diarrhoea for two weeks previous to the attack, and was seized on the morning of the 6th June, at three o'clock, and died in three days from the seizure.

*Fear a predisposing Cause.*—There had been no intercourse between these two patients, and it is supposed that the disease was excited in the latter by fear.

On the morning of the 6th, and within an hour of the attack of the former patient, another case occurred in the immediate neighbourhood of the two former ones. This person had recently arrived from New York; he died on the following day.

"The fourth case," says Dr. M'Naughton, "was Samuel Byington, a passenger agent, attacked June 9th; report does not say at what place; he recovered. From his occupation he may have been exposed among the emigrants.

*No Evidence in the first Cases of Communication with others labouring under the Disease.*—The next was Geo. Foster, a labourer, attacked June 8th, at 29, Dean-street, and died the same day. Had been in the city some weeks; had not been exposed. For two or three weeks before the attack, had been at work to which he had not been accustomed, and had felt exhausted by it.

"The sixth occurred at No. 5, Dean-street; the seventh at 81, Cherry-street; they both recovered. It is doubtful whether these two were cases of cholera. The Board had reason to doubt the diagnosis of one of the reporters in other cases. No. 6 had been to New York recently.

"8th and 9th. Father and daughter, were found in a dying state, at No. 73, Broadway, in a filthy house. It is probable that they died of cholera. No other case was reported from the same vicinity likely to have originated from these.

"The 10th case was that of Mr. John Schoonmaker, the father-in-law of Mr. Geo. Van Zandt, and living in the same house. He was attacked June 10th, and died on the morning of the 11th.

"11th, James Seagraves, 13, Montgomery-street; attacked June 11th, died morning of 12th.

"12th and 13th. John Young, and a man named M'Donald, were attacked at 100, Water-street, and died the same day. One of these had come recently from Springfield, where there was no cholera. It is not known that either of them had been exposed to cholera infection in this city or elsewhere. A number of other cases occurred in the same block of buildings, so that the Board of Health had to thin out the people, and send the sick to the hospital.

# *Relative Mortality at Albany, 1832, 1834, and 1849. 42*

"14th. A stranger from the west died of cholera June 20th, at No. 49, Philip-street. No other case occurred in the vicinity.

"15th and 16th. Mother and child *died* of cholera, corner of Dove and Elm street; a woman died a short time before in the same house, but was not attended by any physician; supposed to have been a case of cholera. Several cases of cholera occurred in the course of a few days among persons who had visited these cases, or had been at the funeral.

"17th. A boy at No. 200, Second-street, Arbor-hill, attacked June 24th. This boy was stout and hearty; was affected with diarrhoea before he was attacked; while in that state went out fishing, and had been standing part of the time up to his middle in water; had 'eaten nothing wrong,' as he expressed himself to, his physician (Dr. H. Townsend). After a very severe attack, he recovered. He had not, to his knowledge, been near any cholera cases.

"18th. A fatal case of cholera, 49, Schuyler-street, June 26th; no particulars given. No other case in the same place.

"19th. A lady from Brooklyn *died* of cholera at 134, Hamilton-street; no other case occurred among the many who visited her or who attended the funeral. In the family which she left a day or two before at Brooklyn, four of the children died of cholera, nearly about the same time she was attacked in this city.

"On June 28th, Dr. Sheldon reported five cases at No. 332, Bowery, two of which proved fatal. It is not known that the people occupying this house had been near any cholera cases; but as the children were vagrants, or street-beggars, they might have been exposed. After this time numerous cases occurred in the neighbourhood, where the epidemic was more severe for several weeks than in any other locality in the city.

*No Evidence of Contagion.*—"Upon a review of these several cases, there does not seem to be any decided evidence that the disease extended to different parts of the city by contagion. It cannot be traced from one quarter of the city to another. In the greater number of the cases the attacks seemed to be independent of each other, and only one person was attacked in the same house or neighbourhood. This remark is as applicable to the cases which occurred after the month of June as to the earliest ones."

*Bowel Affections prevalent previous to the Appearance of Cholera.*—Previous to the appearance of the epidemic, affections of the bowels were more prevalent than ordinary, although from the want of a careful mortuary register no data can be obtained which would be deemed authoritative. From the 5th of June, when the disease first manifested itself, until the 19th of September, when it ceased to prevail as an epidemic, 834 cases occurred, and 332 deaths.

The following tables will exhibit the relative mortality in 1832, 1834, and 1849 :—

	Cases.	Deaths.		Cases.	Deaths.
1832—			1849—		
July 6 to 31 - - -	632	208	June - - - -	48	23
August - - - - -	515	193	July - - - - -	357	123
Sept. { Deaths only }	—	21	August - - - -	353	146
reported - }			September - -	76	40
	1,147	422	October - - -	2	—
			November - -	2	2
1834—				838	334
July to August 31 -	95	63		124	78
September 1 to 15 -	29	15		1,147	422
	124	78	Whole Number -	2,109	834



## NEWARK, NEW JERSEY.

During the month of May 1849, cases of cholera occurred in different parts of the state of New Jersey, both in towns and country. It, however, prevailed more extensively in Newark and Patterson than elsewhere.

*Medical Topography.*—Newark lies partly upon a plain, and partly upon elevated ground, on the Passaic River, about thirty miles south of New York, and contains a population of 38,000 inhabitants, many of whom are engaged in manufactures of various kinds, especially of iron and carriages. Towards the west the ground rises into a range of hills, while on the east it extends to the low and flat marshy border of the river, and is underlayed by a sandy substratum.

*Salt Marsh in front of the Town.*—An immense surface in front of the town, stretching towards the bay, is covered by a salt marsh kept as meadow land, and only accessible during the heat of mid-summer, and the cold of mid-winter.

*Autumnal Fever not unusual.*—It is peculiarly subject to autumnal fever, but as the line of improvement progresses, the tendency to this class of diseases is said to diminish.

The following is Dr. Clark's account of the weather :—

*Temperature and Meteorology.*—"The average temperature of June and July was higher than for several years past, also higher than in 1832. During the first half of June, the average was about 75°, and during the latter half of that month it was over 86°. The atmosphere was heavy, and more chilly to the sense than usual, and there was less rain than in any June for the last six years. From the 17th to the 27th, the weather was unusually hot and dry. In July there was great heat in the middle of the day, and the nights were cooler than usual in proportion. From the 1st to the 11th, the thermometer ranged from 75° to 80° during the day. On the 11th it rose to 87½°, on the 12th to 97°, and on the 13th to 99½°. On the 14th it was 97½°, and on this day the sky clouded; but while there was a heavy rain south of the 'Raritan' only a few drops fell here. The temperature, however, fell 40°, and on the 15th and 16th continued colder by 20° than before the change. During the remainder of the month the mercury rose daily above 81°, and on the 20th, 26th, and 30th, as high as 88°. During the greater part of the day the winds were brisk, and in the latter part of the day generally easterly.

"August was characterized by more rain, a more equable temperature, and clearer atmosphere. There was less than 9° difference between the mean of the warmest and the coldest days; the mean of the month was a fraction over 72°. The winds during the early part of the month were variable, but during the last week they were almost constantly easterly. The past summer was warmer than any of its predecessors since 1845."

*Diarrhœa preceded the Appearance of Cholera.*—Diarrhœa preceded the appearance of cholera by several weeks, and in the latter end of May these cases assumed so severe a form, and were accompanied by so sudden a prostration of the nervous energy, as to have placed them in the category of cholera had the disease existed.

*First Cases appeared at long Intervals.*—The first case of cholera reported at Newark was on the 31st of May. During the month of June but four cases occurred; from the last of June to the 10th of July no new case occurred; from that period to the 24th, 9 deaths from cholera were recorded; from the 24th to the 29th, 17 deaths.

In August the deaths amounted to 82. From the 15th to the 24th of this month the disease manifested its greatest malignity, and the deaths amounted to 10 each day. After that period it began to decline; in September but 6 deaths were recorded, and in October but 2.

*Mortality from Cholera.*—The disease prevailed 100 days, during which 150 deaths occurred, of which 87 were males, and 63 females.

Dr. Clark says :—

“Although the remote causes of the disease are enveloped in impenetrable mystery, among what we do know are these :—That its favourite place of development is where *filth* abounds, where *many are crowded into too small a space, and where noxious exhalations arise.*

*Tendency to visit the same Localities*—“In 1832 many cases occurred in the *very same localities* that were visited this year. There was, however, a group of cases that year in Walnut-street, where, I believe, no case occurred during the past season.

*This Tendency not visible where the Character of the Place was changed for the better.*—“That part of the city was changed in character, and it is not evident what were the existing causes, if any existed at that time. During the present year there occurred about ten cases of *cholera* in *Commercc-street*, between the corner of Mulberry-street and the market, and I am told that cases of diarrhœa occurred in almost every house between these points. The causes are less evident than in some other places. In two other points in the East ward, *Gallagher's-court* and *Durand-street*, both remarkable for their crowded and filthy condition, the cases were numerous and fatal. *Maiden-lane* and *Washington-street*, and the vicinity of the filthy dead stream that flows through that part of the city, and the low grounds in the rear of the ‘Nine-row’ in *Summit-street*, were the most fatal localities in West ward. In the North ward, *Quarry-street* and some parts of *Plane-street*, where streams flow on the surface, most of the fatal cases occurred. In this ward, surely, the disease seemed to incline to filthy and badly-ventilated houses. In the South ward groups of cases occurred in the vicinity of the Chesnut-street depôt. Whether influenced by the low grounds in the vicinity, and consequent malarious atmosphere that prevails, I would not express an opinion.”

#### PHILADELPHIA.

##### *Dr. Purish's Account of the Topography of Philadelphia.*

“The city of Philadelphia, in lat. 39° 57' north, and long. 1° 54' east of Washington, is situated on the western shore of the river Delaware, on moderately elevated ground, extending westward about two miles to the river Schuylkill, which unites with the Delaware, three miles to the south. The Delaware is a mile wide opposite the city, and admits ships of heavy burthen to come to its wharves, which are strung along an extent of nearly five miles. The water continues fresh for about 30 miles below the city, or nearly one third the entire distance to the Atlantic Ocean, by the natural course of the river and bay. In a direct line eastward, across the state of New Jersey, the distance to the sea is about 49 miles.

“The river Schuylkill, opposite the western side of the city, is about 200 yards wide, where it admits sea vessels of moderate draught.

*Geological Formation*—“The portion of the isthmus formed between the Delaware and Schuylkill, on which Philadelphia stands, is of a modern tertiary formation, consisting below of sand and gravel, overlaid with a thick bed of clay, the whole resting on a primitive basis, which shows itself on the surface in some of the north-western districts. Fresh water is easily obtained by digging, in every part of the city and suburbs, at depths varying from 10 to 30 feet. This was formerly soft and excellent, before the contamination incident to the extension of the city, and the usual infiltrations. The water now used is supplied in the greatest abundance from the waterworks erected

## 46 *Preventive Measures in Anticipation of Cholera.*

on the Schuylkill, north-westward of the city. The whole district over which the population of Philadelphia is spread, as well as the adjacent country, which is generally of the primitive formation, admits of the most perfect drainage.

*Extent of the City.*—"The plot of the city proper, forms a parallelogram of a mile in width, from north to south, and about two miles from east to west, or from river to river. But the town has so far overrun the original lines surveyed by William Penn, that by far the larger portion of the population reside in the adjacent districts, which constitute as it were so many distinct wards."

Its population is 450,000.

*Anticipated Attack of Cholera in Philadelphia.*—Previous to the outbreak of cholera in the United States, and while it appeared to be progressing slowly but surely over Europe, the Board of Health anticipating for Philadelphia an attack similar to that which it had experienced in 1832, endeavoured to guard, if possible, against its approach by instituting timely measures for its prevention.

*Preventive Measures adopted.*—With this object in view the sanitary committee of the Board made a report in November 1848, recommending the rigid enforcement of sanitary appliances to check its progress, if possible, or at least to shorten its duration and mitigate its severity.

The following resolutions were recommended, and received the hearty co-operation of the Board :—

### *Resolutions of the Board of Health.*

"Resolved, That the attention of the city councils and the municipal authorities of the districts of the county be specially called to the subject of *sewerage*; and that said authorities be recommended to adopt measures, as early as practicable, to avoid surface drainage altogether, also to attend to street paving, so as to avoid inequalities of surface, whereby water and refuse matters accumulate, as a sanitary measure of paramount importance in the prevention and mitigation of epidemic cholera and other diseases.

"Resolved, That the attention of the city councils and the municipal authorities of the several districts of the county be called to a thorough and more frequent cleansing of the streets and gutters *before 12 o'clock in the day*, and to the cleansing of courts and alleys, and the prompt removal of filth and garbage therefrom; and that they be respectfully requested, with citizens generally, to notify the Board of Health of any accumulation of filth or rubbish, of foul courts or alleys, not within their jurisdiction, also of foul privies, pigsties, or piggeries, or any yards or cellars of houses where offensive matters exist; so that by co-ordinate action we may establish a sanitary police, whereby the epidemic influence may be in a great measure, if not entirely, counteracted.

"Resolved, That the district committees of this Board be requested to report to the Board of Health all houses or places in their respective districts suspected of being in an unhealthy condition, or likely to become so; and diligently to inquire and report all causes or suspected causes of diseases in their neighbourhoods, and particularly imperfect drainage of gutters in low situations, and the causes thereof; and that they be authorized to employ one or more agents to attend to or carry out the above important sanitary suggestions when necessary."

*A Committee appointed to investigate the Disease.*—On the appearance of the disease at Staten Island, the Board appointed a committee to proceed thither in order to investigate it, and advise with the authorities of the city of New York as to the most efficient means of arresting its spread.

*Plan of Hospitals and Dispensaries recommended.*—The Board, likewise, at a later period reported a plan for cholera dispensaries and

hospitals, and directed a thorough sanitary visitation of the city and its adjacent districts, which visit was completed by the 1st of April 1849.

*Summary Powers.*—"Every nuisance was reported by them to their district committees, who were intermediate between them and the Board. The committees examined their reports, and, if satisfactory, presented them to the Board, who, upon sufficient cause, declared the same to be nuisances prejudicial to health; whereupon a notice was served upon the owner, agent, or occupant of the premises complained of, requiring the removal of the same within a specified time, according to the 27th section of the Act of Assembly, passed 29th January 1818, and if not then done, to be done by the health officer at their expense, and they be prosecuted for the penalty. It was made a part of the duty of the agents to follow up these notices, and when not complied with, according to the act of the Board, to give the same into the hands of the health officer, who would have the nuisance removed, and forthwith commence a prosecution for the penalty."

The table at page 48 will exhibit at a glance the labour of the agents of the Board of Health in their purification of the city, and in preparing it for the reception of the epidemic should it appear.

Having established these salutary precautions the Board quietly waited the result, fully confident that the removal of so many causes known to increase the tendency to the disease would not be useless.

*Appearance of Cholera.*—On the 30th of May 1849, three cases of cholera were announced as having occurred in the city. Two of these were on a canal boat, which had reached Richmond the day before from Bridensberg, having three persons on her; the two men who were attacked, and one woman, all of whom were intemperate. Both of these patients died, the woman escaped an attack, and returned to her home after remaining in Philadelphia for a few days. The vessel upon which these cases occurred was in so exceedingly dirty and filthy a state that she was sunk.

The third case, which occurred on the same day, was that of an Irishman, who had recently arrived in this country, and had been in New York a few days previous to the period of his attack. He was at the time in Fourth street, above Shippen, Southwark, and nearly four miles from Richmond, where the two other cases occurred. The patient died in ten hours.

The fourth case reported was in Barclay-street. The man who was the subject of attack, worked at the Delaware Market street ferry, and was seized with the disease on the 31st. On the 1st of June, two more cases were reported to the Board, one in the eastern and the other in the western part of the city, in persons having no connexions with each other.

*Report of the Committee on Epidemics of the American Medical Association.*—The introduction of the cholera into Philadelphia has been investigated with the greatest care by the Committee of Practical Medicine, and Epidemics, of the American Medical Association; from whose report I make the following extract:—

"Letters from the 21 physicians to whose care the first 23 cases of cholera reported to the Board of Health were entrusted, authenticate in the strongest manner the details of them. Two cases occurred on the 30th of May at the upper verge of Philadelphia, in the Richmond district. On the same day, another presented itself in the district of Southwark, on the lower verge of Philadelphia, at the distance of 3½ miles.

*Table of Nuisances removed from October 1848 to October 1849.*

Districts.	Privies cleaned.	Houses closed.	Houses cleaned.	Yards cleaned.	Cellars cleaned.	Privies purified.	Ponds filled or drained.	Hogpens removed.	Stables cleaned.	Filthy lots cleaned.	Filthy alleys cleaned.	Manure heaps removed.	Streets and gutters ordered to be cleaned.	Courts and gutters ordered to be cleaned.	Slaughter-houses cleaned.	Sinks cleaned.	Vaults cleaned.	Rag and bone shops closed.	Burial-grounds closed.	Total.
City Proper -	1,122	35	173	90	265	251	42	328	19	27	138	15	59	24	-	23	10	1	1	2,621
Spring Garden -	894	1	20	65	99	70	52	150	9	22	29	18	9	4	9	4	1	1	1	1,455
Moyamensing -	115	15	80	70	44	45	13	220	18	9	10	4	13	4	12	-	-	16	3	691
Southwark -	119	2	19	49	39	39	11	102	4	9	7	6	2	-	7	-	2	-	-	417
Northern Liberties -	457	-	15	47	37	48	3	24	4	3	8	11	12	-	10	-	2	-	-	681
Kensington -	257	10	33	61	76	46	60	80	5	11	2	5	19	-	11	-	-	-	-	676
Richmond -	6	-	-	-	-	-	5	8	-	-	-	-	-	-	-	-	-	-	-	19
Penn District -	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	4
West Philadelphia -	-	-	-	2	1	2	2	2	-	-	-	-	-	-	-	-	-	-	-	9
Total -	2,970	63	340	384	561	501	188	918	59	81	194	59	114	32	49	27	14	16	3	6,573

*Relative Distances of first Cases from each other.*      49

*Isolation of first Cases.*—"On the following day, a patient was seized within the city proper, a quarter of a mile from the third case. Three quarters of a mile from this, occurred another on the 1st of June, and a sixth on the same day near the Schuylkill, at least  $1\frac{1}{2}$  miles from any of the preceding ones; the seventh case was near the river Delaware, the eighth in the district of Spring Garden, the ninth in the city, near its southern border, and the tenth  $2\frac{1}{2}$  miles from the ninth, at the Point House, entirely below the limits of the city and liberties. On the 11th of June, occurred the eleventh case in Richmond, near to the spot where happened the first two cases, 12 days before, and  $\frac{1}{2}$  miles from the tenth case.

"In 17 days from and after the first case, three had happened in Richmond, three in Kensington, two in Spring Garden, ten in the city, four in Southwark, and one in Moyamensing. Of these, with the exception of the first two, none were within a square of each other, although every district, but those of the Northern Liberties and Penn, had at least one case.

"A few of the gentlemen to whom notes were sent failed to answer them. Two had cases which had been in the immediate vicinity of other cases, but 15 replied decidedly that there was no reason to believe that their patients had been exposed to any infected place, or to any case or cases of cholera. One case, the eleventh, which occurred on the 12th day of the epidemic visitation, had recently visited the infected city of New York.

"The following table exhibits in a single view the facts to which an allusion has been made:—

Names.	Reported.	Distances.		
1. James Johnson -	May 30	1 and 2 to 3, $3\frac{1}{2}$ miles	Janvier,	M.D.
2. J. B. Kirkpatrick -	" "	" "	" "	" "
3. C. Carr -	" "	3 to 4, $\frac{1}{2}$ "	Condie	" "
4. P. Williams -	" 31	4 to 5, $\frac{1}{2}$ "	Smiley	" "
5. E. Couly -	June 1	5 to 6, $1\frac{1}{2}$ "	Reid	" "
6. S. Coyle -	" "	6 to 7, $1\frac{1}{2}$ "	Stokes	" "
7. Female -	" 2	7 to 8, $1\frac{1}{2}$ "	Gegan	" "
8. Ann Wilson -	" 6	8 to 9, $1\frac{1}{2}$ "	Jewall	" "
9. G. M. Forrester -	" 7	9 to 10, $2\frac{1}{2}$ "	Pepper	" "
10. W. Harrison -	" "	10 to 11, $5\frac{1}{2}$ "	Scoffin	" "
11. Captain Seely -	" 11	11 to 12, $1\frac{1}{2}$ "	Janvier	" "
12. J. Harvey -	" 12	12 to 13, $1\frac{1}{2}$ "	Housekeeper	" "
13. — Pierson -	" 13	13 to 14, $\frac{1}{2}$ "	Kreeger	" "
14. J. H. Brown -	" "	14 to 15, $\frac{1}{2}$ "	Hastings	" "
15. — Laikins -	" "	15 to 16, 2 "	Smiley	" "
16. — Butterfield -	" 14	16 to 17, 1 "	Hill	" "
17. J. Lehr -	" "	17 to 18, $\frac{1}{2}$ "	Ingram	" "
18. S. Gemar -	" 15	18 to 19, $1\frac{1}{2}$ "	Fricke	" "
19. J. Dixon -	" "	19 to 20, $\frac{1}{2}$ "	Hershey	" "
20. E. Toll -	" 16	20 to 21, $1\frac{1}{2}$ "	Kline	" "
21. J. Shaw -	" "	21 to 22, $1\frac{1}{2}$ "	Clements	" "
22. S. Lynes -	" "	22 to 23, $1\frac{1}{2}$ "	Aypell	" "
23. — Peterson -	" "	- - -	Gardiner	" "

This quotation contains in a few words one of the most comprehensive and exact descriptions of the introduction of cholera into a city it has been my good fortune to meet; and on account of the care manifested in its preparation, as well as the high source from whence it emanates, is entitled to the greatest consideration.

The cholera was now fairly introduced into Philadelphia. What elements it had to favour its propagation, notwithstanding the vigi-

lance of the Health department of the city, may be judged from the following extracts from their Report:—

*Sources of Disease unabated.*—"It would fill a volume if we undertook to carry the reader through the thousand 'plague spots' in the list of houses closed, and houses, yards, and cellars cleaned, &c. that have infested our city and have undergone personal inspection by the Board and its officers, and which, as far as their ability and power extend, they have wiped away with the sanitary besom. Day after day in their personal visits, did they breathe the pestiferous atmosphere of some degraded or ill-ventilated purlieus, where extremes of filth and misery and loathsome disease met the eye; where horrid heaps of manure from hog and cow pens, putrefying garbage and refuse of every kind, carcasses in disgusting decomposition, filthy rooms, and damp, dirty, and mouldy cellars, full and foul privies in close and ill-ventilated locations, gave off their noxious gases. Many of these localities were in close proximity to contracted and badly-contrived houses, crowded by occupants, filthy and poor, without ventilation or drainage, or receptacles for refuse, or supply of water, or the common comforts of life.

*Rag and Bone Establishments condemned as Nuisances.*—"We cannot, however, omit a brief allusion to the rag and bone establishments in the immediate vicinity of the wretched neighbourhoods of Baker, Bedford, and Spafford-streets, Moyamensing, where moral debasement and physical disorder set at defiance all law, and shame civilization; the very hotbeds of everything offensive and disgusting.

"In these bone establishments, 16 of which were removed, we found heaps of assorted refuse of every variety, gathered by the numerous poor and degraded blacks who infest that vicinity, from the filth of streets and gutters, and vacant lots, and other receptacles for offal, consisting of old rags, bones, iron, shoe-leather, paper, glass, and dog manure, which sent forth a most horrid odour. The whole of these disgusting premises were immediately declared to be, in the most positive terms, nuisances of the worst kind, and every one of them were emptied, cleansed, and closed up. A single visit to these 'Store-houses of refuse' was enough to convince the Board that they must be highly injurious to public health, and productive of diseases of the lowest type."

*Effect of the Vigilance of the Health Department in arresting the Spread of Cholera.*—It was hardly to be expected that where such obvious and long-continued sources of disease existed, their removal could be immediately effected. That the labours of the Health Department were amply rewarded will be shown by the sequel, but that the cholera could be prevented they did not even hope for. The evils lay too deep, and were too firmly rooted in the habits of the population, and the elements of disease by which they were surrounded, to be eradicated except by a long-continued and carefully persevered-in system of proper hygienic measures.

*Number of Cases of Cholera.*—From the 30th of May to the 18th of August, a period of 81 days, 2,141 cases of cholera were reported, and 747 deaths. After the 18th of August, the Board of Health declared that the cholera had ceased to exist as an epidemic, and suspended the publication of the bulletins which up to that time they had issued.

Deaths from cholera continued to occur until the last of September. From the 30th of May to the 22d of September, 1,022 deaths from cholera had taken place.

The following table, taken from the American Journal of Medical Science, exhibits the weekly mortality for the years 1848 and 1849,



*Prevalence of Bowel Affections during the Epidemic. 51*

for the period during which cholera occurred in Philadelphia, together with a summary of all the deaths from bowel complaints:—

	Total Mortality.	Cholera Asphyxia.	Cholera Infantum.	Cholera Morbus.	Diarrhoea.	Dysentery.	Inflammation of stomach and bowels.	Other diseases of the stomach and bowels.	Total from bowel complaint.
<b>1848.</b>									
Week ending—									
June 3 - -	130	-	6	1	1	-	6	-	14
" 10 - -	165	-	16	3	3	4	5	5	36
" 17 - -	181	-	22	1	6	5	5	1	40
" 24 - -	244	-	45	3	4	16	7	1	76
July 1 - -	220	-	48	3	5	13	10	2	81
" 8 - -	228	-	53	3	10	11	5	7	89
" 15 - -	208	-	41	4	4	20	10	3	82
" 22 - -	182	-	33	3	5	14	12	-	67
" 29 - -	194	-	34	2	8	20	4	-	68
August 5 - -	160	-	35	1	2	7	9	1	55
" 12 - -	174	-	21	1	8	20	4	3	56
" 19 - -	174	-	21	1	10	16	8	2	58
" 26 - -	154	-	19	-	2	17	7	3	48
September 2 - -	168	-	13	-	4	17	6	3	43
" 9 - -	184	-	16	-	4	19	5	4	48
" 16 - -	132	-	10	-	6	9	2	4	31
" 23 - -	135	-	5	-	1	14	8	1	29
	2,983	-	438	25	83	222	113	40	921
<b>1849.</b>									
June 2 - -	188	3	3	1	3	2	3	-	15
" 9 - -	180	3	-	1	2	2	5	1	14
" 16 - -	119	5	6	3	4	1	1	-	20
" 23 - -	184	14	20	5	2	31	3	1	76
" 30 - -	343	80	40	9	13	15	8	2	167
July 7 - -	404	170	53	11	13	14	8	-	269
" 14 - -	458	179	57	6	15	29	4	3	293
" 22 - -	505	195	68	5	12	28	14	5	327
" 28 - -	415	136	58	3	10	38	8	1	254
August 4 - -	360	95	54	9	12	40	5	3	218
" 11 - -	303	40	46	1	13	42	4	3	149
" 18 - -	328	42	56	5	18	40	3	6	167
" 25 - -	248	16	32	2	12	46	7	2	121
September 1 - -	231	18	23	2	10	39	6	1	100
" 8 - -	214	16	14	2	8	29	3	4	73
" 15 - -	207	4	11	-	8	28	9	3	64
" 22 - -	183	6	9	2	4	23	4	-	48
	4,770	1,022	550	67	159	447	95	33	2,375

From this table, it will be seen that during the prevalence of cholera, affections of the bowels of all kinds having an analogy to this disease were greatly increased and more than usually fatal.

By a comparison of these results with those of the two former

years, this increase of bowel affections will be rendered still more manifest. From the 1st of June to the 1st of September in each year, it will be seen, that since 1846 there has been an annual aggregate increase of mortality from the four bowel diseases,—dysentery, diarrhœa, cholera morbus, and cholera infantum, as the following table will show :—

Years.	Dysentery.	Diarrhœa.	Cholera Morbus.	Cholera Infantum.	Total.
1846	37	55	12	272	376
1847	87	83	15	367	552
1848	163	63	25	388	639
1849	337	137	62	512	1,046

The following table, showing the cases that occurred in private practice which were reported to the Board, will point out the localities most affected by the disease :—

Districts.	Population.	Cases.	Deaths.	Ratio of Cases to Population.	Ratio of Deaths to Cases.	Ratio of Deaths to Population.
City -	118,491	388	127	1 to 305'39	1 to 3'05	1 in 933'00
Southwark -	36,458	276	50	1 to 132'09	1 to 5'52	1 in 729'16
Kensington -	47,697	218	54	1 to 218'79	1 to 4'03	1 in 888'27
Spring Garden -	54,532	108	33	1 to 504'92	1 to 3'27	1 in 1652'48
Moyamensing -	25,705	191	52	1 to 184'58	1 to 3'67	1 in 496'25
Northern Liberties	49,321	147	38	1 to 335'51	1 to 3'86	1 in 1297'92
Penn District -	7,325	14	4	1 to 523'21	1 to 3'50	1 in 1831'25
Richmond -	5,529	39	13	1 to 141'77	1 to 3'00	1 in 435'30
West Philadelphia	3,413	21	11	1 to 162'52	1 to 1'90	1 in 310'27
Passyunk -	1,529	10	3	1 to 152'90	1 to 3'33	1 in 509'66
Unknown -	—	6	1	—	—	—
Total -	350,000	1,418	386	1 to 246'82	1 to 3'66	1 in 906'73

“ From a dissection of this table, we derive some information of a sanitary character, which not only possesses interest, but many prove useful in the event of a recurrence of cholera, or some other equally alarming epidemic.

“ That the epidemic was not confined to any one portion of Philadelphia, but that all suffered a share of its malign influence.

“ That Southwark, Moyamensing, and Richmond, in the order they stand, show the most unfavourable ratios of cases to population, the mean ratio being 1 to every 136 inhabitants ; while Penn and Spring Garden present the most favourable, 1 in every 514 ; West Philadelphia 1 in every 162. The Northern Liberties gives 1 in every 335½ ; the city 1 in every 305'39, and Kensington 1 in every 218'79. The increased ratio of cases to population in Southwark must be attributed to its want of cleanliness, its locality, to the character of a portion of its inhabitants that reside in the more densely populated neighbourhoods, and to its numerous confined and ill-ventilated courts and alleys. That of Moyamensing, to the depraved condition of hundreds of its inhabitants, to the filthy and crowded condition of many of its small bow-windowed cellars, and their vitiated atmosphere, to the noxious

*Boston.—Dampness of Portions of the Soil.*

exhalations from their persons and clothing, and the numerous collections of offensive bones and rags, and other offal, heaped up and arrayed for sale in many of their small streets. In Richmond, to its locality along the river front, its want of drainage and sewerage, and also the character, habits, and occupation of a large portion of its population, viz., canal and river boat-men, coal-heavers, and labourers.

"In Kensington, the chief cause lies in the unpaved, ungraded, and undrained condition of many of its streets.

"Penn, almost a rural district, elevated and dry, and to the north-west of the city, with a population of 7,325, reported only 14 cases and 4 deaths, whilst West Philadelphia, situated along the western border of the Schuylkill river, with a population of only 3,413, gave 21 cases, and 11 deaths; locality in these two instances must explain the comparative exemption of the former from the epidemic, and its increased prevalence in the latter.

"Spring Garden, next in point of healthfulness to Penn, exhibiting only 1 case to every 504.92 of its inhabitants, is situated high above the two rivers bounding the city, is well improved, its streets wide, well paved, graded, its underground sewerage many miles in extent, free from a depraved population, and exempt from an excess of crowded and ill-ventilated courts and alleys that exist elsewhere."

BOSTON.

Boston is situated upon a peninsula about three miles in length, and one in breadth, jutting out into one of the finest and most capacious harbours in the United States, dotted over with innumerable islands, which are gradually yielding to the constant beating of the ocean upon them. This peninsula originally contained about 700 acres of land resting upon a granitic formation, but its dimensions have been greatly increased by filling up its borders near the water, so that a considerable portion of the town occupied as wharves is built upon ground reclaimed from the bay. This superimposition has for the most part been executed with mud from the flats, and organic substances from the older parts of the town, in a state of partial decomposition. Upon this made ground whole streets were built, long before it became solid, and without the least attention to a mode of getting rid of water. The consequence is, that the water can only escape at low tide and returns with the rise, so that in many of these tenements the water can be heard below, and often rises above the first floors with the rise of the tides; drainage in such positions is next to an impossibility.

Dwellings of this class are usually in the most filthy condition, and neglected alike by landlord and tenant. Dr. Buckingham has found 40 or more occupants in a two-story house of this kind, and has known 11 to occupy one room, and eight grown men and women, one bed constantly. Its surface is very irregular, and many of its higher points rise to a height varying from 50 to 100 feet above the level of the sea, affording commanding sites for building or observation. These spots have been to a considerable extent preserved, so that their effect is quite picturesque and agreeable.

The streets which were not laid out after any fixed plan are frequently irregular and narrow, and in the older portions of the town present a crowded population, equal to the most objectionable parts of European towns. The public square known as the Common is

not equalled either in extent or beauty by any other in the United States.

Its confined peninsular position has brought it into immediate proximity with East Boston on the one side, and South Boston on the other. Its borders are encircled with a number of other towns, as Cambridge, Roxbury, Quincy, and Charlestown, which may be considered as parts of the city itself, so immediately are they dependent upon and tributary to it. The vast amount of commerce attracted to the wharves of the peninsula has rendered ground in this vicinity of great value, and given rise to an immense amount of overcrowding of population. It lies in 42° 21' 23", N. lat., and 71° 4' 9", W. lon., and contains a population of 138,788 inhabitants. Of this population a much larger amount is embraced in the poorer classes, and especially the foreign poor, from the circumstance that the native inhabitants have sought more commodious and airy homes in the surrounding country, leaving the peninsula, and especially its lower portions, to those whose daily toil and straightened means render it a matter of necessity.

"The attention of the municipal authorities was called to the subject of Asiatic cholera as early as September 1848, by a communication from the Board of Health of Philadelphia. A joint committee of the city council was immediately formed to consider the matter, and the consulting physicians were requested to give their opinion upon the probability of the approach of the disease, and the preparatory steps that should be taken in reference to it. Their report was published in the newspapers, and notices were sent out and left at all the residences of the inhabitants, calling their attention to the state of their houses and yards.

"In addition to these measures the city council resolved themselves into special joint committees, and to each of them was assigned the custody of one of the wards of the city, for greater facility in examination, and reporting cases of nuisances. Special agents were also employed in the most exposed districts during the month of December, and much valuable work throughout the city was accomplished before the close of the year. The further active prosecution of sanitary proceedings was suspended during the winter months, in consequence of the coming in of a new city government, and the diminished probability of a speedy approach of the epidemic within our limits. But early in the spring, the attention of the authorities was again called to the subject, by the arrival of the disease at New York. The old arrangement of joint committees of the city council having been found practically inconvenient and cumbersome, the Board of Health, consisting of the mayor and aldermen, undertook the sole charge and responsibility of all future measures in reference to this matter. For greater convenience, the city was divided into districts; each of which was placed under the particular care of a member of the Board, with power to obtain from the police and internal health department as large a force as should be necessary for the effective and thorough cleansing of his district. All nuisances not removable in a summary way were reported to the Board, which passed the necessary orders and carried them into effect through this committee.

"The Board commenced their labours by republishing the report of the consulting physicians in the public journals, and leaving printed notices at each house in the city, requesting the inhabitants to thoroughly cleanse their houses, yards, privies and drains, and deposit all decayed vegetable and animal matter, and other deleterious substances, in the streets opposite their dwellings, on certain specified days. The requisition was very generally complied with, and a large number of carts were at once employed to carry off what had thus been collected. The police, under the city marshal, were then

### *Establishment of temporary Hospitals, &c.*

detached, in squads proportioned to the size of the respective districts, carefully inspect from garret to cellar every building in the city, to see to the removal of every offensive substance which could not be removed, and to report all cases of important or permanent nuisances to the committee. They performed the laborious service with great fidelity in the most quiet and gentlemanly manner; and, it is proper to state, the inhabitants everywhere received them with kindness, and seemed to aid them in the proper discharge of their duties. After this examination had been completed, and sufficient time allowed for the removal of what had been collected, the whole force of the police, with the health departments, with such other assistance as was required, were directed to the immediate removal of the nuisances which had been reported to the Board. In addition to an immense amount of filth of all sorts, from houses, yards, and streets, several thousand vaults were emptied, many scores of drains cleansed, repaired, or newly constructed. In consequence of these efforts, the city was soon in a greater state of cleanliness than it ever had been since its foundation; but in order to prevent the labour which had been expended might not be lost, the police were detailed in squads to visit in daily rounds every part of their respective districts, and carts were assigned to them for the immediate removal of offensive substances which they might find. Every street was swept, the house dirt and offal were carried off from each dwelling twice a week through the health department, and in the exposed localities these extraordinary labours were performed daily, under the direction of the police. Many yards, lanes, and by places, in different parts, were also daily drained with cochituate water. The services were continued through the summer; and too much praise can hardly be given to the city marshal and his numerous assistants, for the zeal, fidelity, and promptitude with which they carried out every order, or even suggestion, which they received from the Board.

"On the approach of the cholera, several additional measures were taken. Printed notices were published in the journals and posted in various places, containing directions as to regimen, diet, clothing, and treatment to be pursued on the discovery of premonitory symptoms. The police were directed to see that houses and cellars in exposed places were whitewashed; large quantities of disinfecting substances were purchased and freely distributed wherever they were required. The inhabitants were notified to cleanse their house-drains with cochituate water, and the common sewers were ordered to be washed at different periods during the summer. The Board directed the large tract of marshy land constituting the Back Bay to be flooded from the ocean, and the water to be retained at as great a height as the drains flowing into it would permit. By a special order, vessels arriving in the harbour with fruits or other objectionable substances were ordered to report themselves to the hospital physician at Deer Island, by whom they were thoroughly examined; and all decayed or deleterious portions of their cargoes were removed, or thrown overboard, before a permit was granted to come up to the city.

"For the relief of the poorer classes, the Board fitted up a large building on Fort-hill, formerly a gunhouse, as a cholera hospital, and placed it in the charge of this committee. A medical staff, under the direction of Dr. Clark, the city physician, and all necessary nurses and attendants, were speedily provided, and the whole establishment was ready for the reception of patients before its use was required. As a further measure, your committee, with the consent of the Board and the approval of the consulting physicians, appointed special physicians for each ward, who were required to visit and prescribe for cholera patients at their own dwellings, and be at their service both day and night, with power to procure nurses and medicine. By this means great additional medical aid was afforded, and the first stages of the disease were more effectually watched and checked.

"The thanks of the Board and of the whole community are due to the medical gentlemen and all their assistants, at the hospital and elsewhere, for their promptitude, judgment, humanity, skill, and fidelity, during the whole progress of the disease. Their labours were arduous and unremitting day and night, and those rendered at the hospital were wholly without pecuniary compensation."—*Report of the Health Committee.*

From the above account it will be seen that the city was well prepared for the cholera before its arrival; and though the precautionary measures which had been taken did not prevent the anticipated attack, there is every reason to believe that they were effective in checking its progress and diminishing its virulence. As is well known, most persons throughout the city were more or less affected by the cholera atmosphere; but few cases of the actual disease, and still fewer deaths, occurred in any of the more dry and airy portions of the metropolis. The epidemic made its first attack and spent its force in those localities which were nearest to the level of the sea, and, in fact, rescued from it by filling up with dock-mud; which were the least perfect in drainage, the worst ventilated, and the most crowded and filthy.

And, although its fatality in these districts was considerable, it cannot be doubted that it would have been much more so, except for the extraordinary care and vigilance which had been taken to put and keep them in as good condition as circumstances would permit. It ought also to be added, that personal habits seemed to be quite as important as locality in determining an attack of the complaint. For the most part, the temperate, the moral, the well-conditioned, escaped; whilst the imprudent, the vicious, and the poorly fed succumbed to its insidious influences.

The first case of cholera occurred at No. 11, Hamilton-street, on the 3d of June; the individual attacked was an Irishman. Four deaths occurred during the week ending the 8th of June, and but two in the following week. The total number of deaths for the month of June, from all causes, was 306, of which but eight were from cholera. The *Boston Medical and Surgical Journal* of the 13th of June thus alludes to its appearance in Boston, and the anxiety of the public mind concerning it:—

"It is the universal topic in highways and byeways, in the parlour and kitchen, and is discussed and re-discussed in all the papers from Maine to Mexico. This universality of excitement unquestionably predisposes the people to be preyed upon by the disease. Fear,—a restless and undecided feeling in regard to determining how to act under the influence of a great impending calamity,—weakens the powers of resistance, and the vital energies give way to a force that might otherwise have been readily overcome.

"Cases of cholera have been finally recognized in Boston, but we are not apprehensive of much danger. If it is true that a granite region of country, thus far in the history of this scourge of modern times, has never suffered essentially from its introduction, then there is every reason for hoping that New England has no food for the pestilence."

Yet, notwithstanding this restless feverishness, the disease progressed with an exceedingly slow pace during the entire month of June. In July, with the increase of temperature, the number of

*Localities in Boston where Cholera appeared.*      57

deaths from cholera amounted to 46, in August to 412, in September to 142, and in October to 3, when it finally subsided. Of this number (611) but 163 were Americans, and by far the greater proportion were from Ireland.

The following list of locations in which cases occurred commences at the south end of the city, and proceeds nearly regularly, according to the map, towards the north and west.

LIST OF LOCALITIES,  
*with the Number of Cases occurring in each.*

	Cases.		Cases.
Allen's Block, Arnold-street	- 7	Brought forward	- 170
Concord-street	- 1	Humphrey-place	- 7
13, Hamburg-street	- 1	Hamilton-alley	- 2
Fabin-street	- 1	Wendell-street	- 1
West Dedham-street	- 1	Oliver-street	- 13
Middlesex-street	- 1	Battery-march-street	- 23
Suffolk-street	- 1	New Broad-street	- 2
Erie-street	- 1	Broad-street	- 65
East Orage-street	- 2	Burgess-alley, B.	- 16
705, Washington-street	- 1	Baker's-alley	- 7
Corey-avenue, Ash-street	- 1	Marsh's-alley	- 1
98, Warren-street	- 1	Wharf-street	- 10
Knox-street	- 1	Well-street	- 8
Church-street	- 5	Broad-street	- 6
Marion-street	- 1	Milk-street	- 3
Shaving-street	- 4	Haward-place	- 1
Cove-street	- 12	Commercial-street	- 2
Cove-place	- 12	Commercial-wharf	- 2
Eliot-street	- 3	Cross-street	- 7
Foster-place	- 2	Ann-street	- 31
La Grange-place	- 1	Keith's-alley	- 4
Fayette-court	- 1	Mechanic's street and court	- 12
Kneeland-street	- 2	Lewis-street	- 1
Albany-street	- 2	Moon-street-court	- 1
Utica-street	- 2	Hatter's-square	- 2
East-street	- 4	Richmond-street	- 4
Sea-street	- 44	Hanover-street	- 15
South-street	- 4	Lime-alley	- 2
Essex-street	- 1	Charter-street	- 1
Oliver-place	- 1	Tileston street	- 1
Etna-place	- 1	Prince-street and Salem	- 34
36, High-street	- 1	Bartlett-place	- 1
Federal-street	- 1	North Margin-street	- 2
Sullivan-place	- 4	Endicot-street	- 11
Fort-hill Hospital	- 2	Stillman-street	- 3
Atkinson-street	- 4	Thatcher street and court	- 2
Washington-avenue	- 6	Charleston-street	- 1
Leman's-alley	- 1	Causeway-street	- 1
Purchase-street	- 7	Portland-street	- 2
Hamilton-street	- 21	Deacon-street	- 1
Hamilton-court	- 1	Merrimack-street	- 1
Carried forward	- 170	Carried forward	- 479



	Cases.		Cases.
Brought forward	479	Brought forward	541
Andover-street	1		
Nashua-street	3	<i>East Boston.</i>	
Lowell-street	1	No location mentioned	21
Cotting-street	1	House of Industry	23
Wall-street	2	Lunatic Hospital	10
South Margin-street	5	House of Correction	4
Gouch-street	1	Second-street	5
Pitts-street	2	Third-street	7
Ivers-street	1	Fourth-street	2
Distil House-square	1	Fifth-street	2
Cambridge-street	1	A-street	4
Staniford-street	1	C-street	1
Temple-street	1	Silver-street	1
Balknap-street	1	Swan-street	6
South Russell-street	1	Broadway	3
North Russell-street	7	Deer Island Hospital	28
Allen-street-place	1	From Shipboard	10
Lovett-place, Poplar	1		
Spring-street	2	<i>East Boston.</i>	
Milton-street	1	Location not reported	26
Brighton-street	4	Centre-street	1
Fruit street	1	Lexington-street	1
Fruit-street-place	1	London-street	3
Bridge-street-court	1	Maverick-street	2
Cyprus-street	1	Marion-street	1
North Grove-street	2	Liverpool-street	5
Grove-place	1	Havre-street	1
Butolph-street	1	Kelley-place	1
West Centre-street	1		
James-place, West Centre-street	1		709
Southac-street	2	Location unknown	20
May-street	2		
May-street-court	1	Total	729
West Cedar-street	5	Recovered	96
Mount Vernon-street	1		
Charles-street	2	Total Deaths	633
Carried forward	541		

*Place of Birth.*

Ireland	460
Children of Irish parents	49
England	18
Scotland	14
British Provinces	18
Continent of Europe	11
West Indies	2
Boston	42
Massachusetts	42
New England and other States	73
	<u>729</u>

## Ages.

Years.	Years.	Years.	Years.	Years.	Years.
1 13	11 4	21 10	31 10	41 4	1 to 5 - 63
2 13	12 5	22 14	32 7	42 12	5 " 10 - 40
3 8	13 2	23 8	33 15	43 5	10 " 15 - 18
4 11	14 4	24 11	34 13	44 8	15 " 20 - 36
5 18	15 3	25 25	35 42	45 23	20 " 25 - 68
— 63	— 18	— 68	— 87	— 52	25 " 30 - 101
6 12	16 3	26 7	36 18	46 7	30 " 35 - 87
7 1	17 5	27 16	37 11	47 4	35 " 40 - 87
8 14	18 9	28 15	38 14	48 5	40 " 45 - 52
9 4	19 10	29 17	39 9	49 7	45 " 50 - 39
10 9	20 9	30 46	40 35	50 16	50 " 55 - 22
— 40	— 36	— 101	— 87	— 39	55 " 60 - 19
103	54	169	174	91	60 " 65 - 18
51 6	61 3	71 —	81 —	91 —	65 " 70 - 6
52 4	62 4	72 —	82 —	92 —	70 " 75 - 1
53 1	63 2	73 —	83 1	93 —	75 " 80 - 2
54 6	64 2	74 1	84 —	94 1	80 " 85 - 1
55 5	65 7	75 —	85 —	— 1	85 " 90 - —
— 22	— 18	— 1	— 1	—	90 " 95 - 1
56 8	66 4	76 —	86 —	—	661
57 2	67 —	77 1	87 —	—	Unknown - 68
58 1	68 —	78 —	88 —	—	Total 729
59 1	69 —	79 —	89 —	—	
60 7	70 2	80 1	90 —	—	
— 19	— 6	— 2	—	—	
41	24	3	1	—	

This subject cannot be better illustrated than by giving the topography of the places visited by cholera, by Dr. Clark.

"As this epidemic has, in a very remarkable manner, domiciled itself, so to speak, in localities nearly all of which have in common certain easily recognizable and well-defined peculiarities, we procured some perspective drawings and plans of several of them, as specimens of the rest; they give a sufficiently accurate impression of the uniformly crowded state of the buildings, of their inaccessibility to air, and the apparent impossibility of arresting the spread of disease in such situations, or of treating satisfactorily in them any of its victims.

"The foregoing statistics furnish the history of the origin of 729 cases, 633 of which were fatal. The sources of information are the records of the hospital and the books of the city registrar, at the City Hall.

"The reports of the office of the city registrar being mostly made by the undertakers of funerals, and not by medical authority, are not of course entitled to implicit confidence, but we have no doubt that they give a very fair approximation to the exact truth.

"There were, doubtless, some cases reported as cholera which were not so, especially of children under 10 years of age, as our experience at the hospital gave us the impression that it was seldom fatal in this class of subjects. These may be fairly set off by the deaths among adults from drunkenness, or by drinking cold water, which were reported as cholera.

"The exact age was also evidently only approximately given, the foreign population being very ill informed in regard to their advance in life. This fact is indicated upon the records by the large numbers reported as having died at the ages of 25, 30, 35, 40, &c., showing that the persons were *estimated* to be about those periods of life. But while this renders the statement uncertain for a particular year (of the age), it does not affect the results for periods of five years.

"Of the 707 cases, 385 were males, and 322 females. Their birth-places and ages are given in the accompanying tables.

"Isolated instances of the disease were noticed in even the most salubrious portions of the city; but, with a very few exceptions, the disease was confined to unhealthy, ill ventilated, and crowded localities. The lower parts of the city, where the drainage is difficult, and the cellars more or less invaded by the back-water, those reclaimed from the ocean, and those in the vicinity of the marshes, were invaded by the pestilence. As instances in point, we may cite the cases which occurred in the new streets upon the Neck and the South Cove, Church-street, Sea and East streets, Battery-march-street,\* Broad, Wharf, Well, and Bread streets, Ann-street, and its neighbourhood, Nashua and Brighton streets, and South and East Boston.

"In nearly all these localities an overcrowded population, bad ventilation, insufficient and unwholesome diet, *intemperance*, and the entire absence of cleanliness, have been most efficient adjuvants in assisting the operation of other causes.

"As examples of the influence of filthy habits, deficient ventilation, &c., in what would be considered as healthy situations, may be mentioned the cases which originated in Oliver and Hamilton streets, Sullivan-place, and Atkinson, Hanover, West Cedar, Southac, and May streets. So many instances might be cited from our personal knowledge of the localities where the majority of the cases occurred, that we are quite certain that the influences alluded to above are, as a universal rule, the exciting cause of the disease, with the occasional exception of those cases which are evidently produced by an unusual indulgence or excess.

"The city institutions of South Boston furnish evidence of the liability of persons of enfeebled constitutions to be attacked by the disease, even when removed to a healthy location, and furnished with clean rooms and a regulated diet.

"A considerable number of deaths are reported from these institutions, especially from the House of Industry, notwithstanding the great advantages enjoyed by the medical officers in being able to place the patients under treatment from the first moments of the appearance of the disease.

"The exact place, whenever it could be ascertained where each case originated, has been indicated, so that if the epidemic should re-appear, as it is certainly not unlikely to do, the Health Commissioners may have it in their power to ascertain at once not only what streets but what particular buildings will be likely to require the process of purification. In cases where the number of the house is not designated, as in portions of those reported in Broad, Cove, Sea, and some other streets, it is presumed that most of the cases originated, directly or otherwise, in the houses which were known to be the chosen foci of the disease.

"Most of the worst localities are easily to be recognized on the accompanying list. Among them, as conspicuously bad, may be cited the houses in the rear of 136, Hanover-street,† Mechanic's-court No. 14, Battery-march-street, Humphrey-alley, Burgess'-alley, Cross, Broad, Well, and Wharf streets.

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\* "Formerly Battery-marsh-street, a name which is quite appropriately descriptive."

† "It is worthy of note that a few years since typhus or typhoid fever prevailed here to an unusual extent."

"At East Boston there were a number of fatal cases in or near Liverpool-street; in every instance, as far as can be ascertained, the houses which were visited with the pestilence, were without proper drains, while others in the same locality, and in otherwise the same circumstances, but *well-drained*, entirely escaped.

"It will be observed that the hospital was located near the scenes of the greatest ravages of the disease. This was most appropriately done. That it did not constitute a focus of contagion may be proved by the circumstance that several cases originated in its vicinity before it was occupied by patients from other parts of the city, as also by the fact that the disease was not manifested in all directions around it. *No cases occurred in the houses upon the square.* They were limited entirely to the houses (on the north-easterly side of the hill) which were occupied by the most miserable portion of our population, living in the most miserable manner; while those residing under better circumstances, in the opposite direction from the building, were entirely exempt from the visitation of the malady.

"It will be observed that about 200 cases occurred within a circle having a radius of a few rods only, whose centre was in Broad-street, near Burgess'-alley. The population of this district is enormous.

"Half-moon-place is situated in the rear of Broad-street, and is formed by a kind of excavation into the side of Fort-hill, the houses which form its semi-circular side being built either against the hill, or separated from it by a space of a few feet. It has two narrow entrances between blocks of houses on Broad-street, and 'Jacob's Ladder,' which, at the time of the prevalence of cholera was a very dilapidated staircase, that connects it with Humphrey-place, and thus with the higher streets upon the hill. Baker's-alley, one of its entrances, forms its northern boundary, and Burgess'-alley extends from its southern extremity. The side towards Broad-street is formed by the sheds in the rear of the houses on that street, with extremely dirty back-yards and a fair proportion of privies.

"To the right of Jacob's Ladder is a cluster of six privies, situated nearly in the centre of the place. At the time of the epidemic these were greatly out of repair, and the ground about them was covered with their overflowing contents, removed only by evaporation. They have been repaired since, so as to present a better outward appearance. A fence has since been erected, as a screen, at the side of the Ladder, to hide the deformity of its neighbourhood. At the foot of the drain are two more clusters of privies, six in number; in the open space are three cesspools, intended to convey off the dirty water, but which were choked by all sorts of vegetable matters, as fragments of cabbage and potatoes, and as these accumulated, they were scooped out and thrown upon the ground near them, which was thus plentifully bestrewn with putrefying vegetable matters. With these were mingled no small proportion of substances still more loathsome.

"The houses to the left are from four to six stories in height, and are crowded with inhabitants. Their rear was only separated from the stone-wall, which supported the side of the hill, by a space of a few feet, and here the contents of the drains from above found a receptacle, creating a perpetual humidity, which must have reminded the tenants of their native land.

"Burgess'-alley runs from the southern extremity of Half-moon-place, and its houses, fruitful sources of examples of the disease, are destitute of any opening whatever in their rear, being built against the hill, and in front are separated from the rear of the houses on Broad-street by merely the width of the alley, and a row of narrow sheds and privies. No idea can be conveyed of such situations as to the actual narrowness of the limits occupied by an immense population, and the utter impossibility of a healthy circulation of air in such locations, where a free ventilation is especially demanded by the supreme filthiness of the persons who occupy them.

"What is called a triple cellar would scarcely be believed to be a reality by those unacquainted with some of these localities. The principal tenant considered his accommodations of the most desirable character. The first cellar from the street was occupied, in one corner, by a bar for the sale of

refreshments, and served as kitchen and parlour. The second, into which two beds were crowded, served as the family sleeping-room, whilst the third, a dungeon, six feet square, and the same in height, (with no aperture for the admission of air, save the narrow door, which was closed at night), served to accommodate boarders.

"The landlord said the tide came through the floors of his rooms but rarely! yet nothing is adequate to give a true impression of its darkness and its loathsomeness. The family was warned by the visiting physician of the district not to permit these inner rooms to be occupied; yet he was called, a few nights after, to see a man in this very den, who, two or three hours previously, was in apparent good health, but had then already reached the stage of hopeless collapse.

"One cellar was reported by the police to be occupied nightly, as a sleeping-apartment, by thirty-nine persons! In another, the tide had risen so high that it was necessary to approach the bed-side of a patient by means of a plank, which was laid from one stool to another, while the dead body of an infant was actually *sailing* about the room in its coffin.

"Many of the inhabited cellars in this vicinity are inundated by the back-water of the drains during high tides; and being entirely below the level of the side-walks, they are necessarily, therefore, almost entirely without light or ventilation. But, far from being considered a hardship, a residence in them is considered preferable to loftier apartments. They are said to be colder in summer and warmer in winter, and consequently command higher rents.

"Another locality, which furnished a number of victims, is a nest of miserable tenements at the easterly corner of Stillman and Endicott streets. They are filled to overflowing with a most vicious, miserable population; even the cellars under the long low building, and into which it is very difficult to *crawl*, are inhabited, although the crazy timbers overhead threaten each moment to entomb, or the waters beneath to drown them.

"There is another place in the rear of 136, Hanover-street, which was inhabited chiefly by the unfortunate 'Crowe' family. It will be recollected that some of the earliest cases occurred here, and the victims were seized and died in such rapid succession as to attract special attention to the spot. There were something like twelve deaths here, in a period of little more than two days, out of a population of less than fifty persons.

"The passage leading into it, being about fifty feet, with none beyond, and the entire absence of any yard in the rear, is the reason, therefore, why all the excrementitious matters, the refuse vegetables, &c., should be constantly accumulated in the centre of the place. Nothing arrested the fearful progress of the disease here but the immediate removal of all the inmates, and a thorough cleansing of the premises.

"The large building on the left was in tolerably good repair, but excessively crowded with inmates. On the right is a building which formerly was the rear wing of a larger house. It is a very dilapidated and incommensurable building, with very low and narrow rooms. It was with the greatest difficulty that the people were persuaded to leave these wretched quarters. The 'horse-litter' was sent repeatedly for them, and although some of them were found sick upon the floor, all the energy of the authorities was required to overcome their listless indifference to their fate.

"An examination of the habits of the victims of cholera shows with how much discrimination they were selected for its attack, while the rate of mortality among those who were intemperate is still more remarkable.

"Of the whole number of patients at the hospital (262), 154 were known to be intemperate, and 108 who were *supposed* to be temperate.

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\* An easy covered carriage (containing a bed), for the conveyance of patients which was constantly in readiness, day and night, in the hospital-yard.

" The whole number of deaths was 166 :—			
Of those who were temperate	-	-	37
" " intemperate	-	-	129
Total			166
" The whole number of recoveries was 96 :—			
Of the intemperate	-	-	25
Of the temperate	-	-	71
Total			96

" The experience of this epidemic has certainly given most satisfactory evidence of the power and value of sanitary measures; for, as we have stated in the early part of this report, while no person was attacked without some obviously existing cause, so, in every case in which those much exposed were removed from these deleterious influences, and provided with cleanly, airy apartments, and suitable food, an attack of the disease was averted.

" The laws of nature, although immutable, are beautifully adapted to the welfare and happiness of mankind. In nothing can this fact be more strikingly illustrated than in its relation to the public health, in a city whose natural advantages, for improvement in this respect, are not surpassed by any other.

" Modern science has demonstrated that the most malignant epidemics may be greatly controlled by efficient sanitary reforms. It is not unreasonable, therefore, that for the future, the legal custodians of the public health (the necessary means being first placed at their disposal,) should be held to a strict accountability for its conservation.

" For the Medical Staff of the Hospital.

" (Signed) HENRY G. CLARK, *Superintendent.*"

This statement of the city physician is still further amplified by the Report of the Board of Health.

" We would now refer to another subject, which, in our view, also demands the attention and action of this Board. We allude to the very wretched, dirty, and unhealthy condition of a great number of the dwelling-houses, occupied by the Irish population, in Battery-march, Broad, Wharf, Wells, Bread, Oliver, Hamilton, Curve, Atkinson, Brighton, Cove, Ann, and other streets. These houses, for the most part, are not occupied by a single family, or even by two or three families, but each room, from garret to cellar, is filled with a family consisting of several persons, and sometimes with two or more families. The consequence is an excessive population, wholly disproportioned to the space or to the accommodations.

" From the very necessities of the case, these residences soon become polluted with all manner of bad odours. In such a state of things, there can be no cleanliness, privacy, or proper ventilation, and little comfort; and with the ignorance, carelessness, and generally loose and dirty habits which prevail among the occupants, the necessary evils are greatly increased both in amount and intensity. In Broad-street, and all the surrounding neighbourhood, including Fort-hill, and the adjacent streets, the situation of the Irish, in these respects, is particularly wretched. During their visits last summer, your Committee were witnesses of scenes too painful to be forgotten, and yet too disgusting to be related here. It is sufficient to say, that this whole district is a perfect hive of human beings, without comforts and mostly without common necessities; in many cases, huddled together like brutes, without regard to sex, or age, or sense of decency: grown men and women sleeping together in the same apartment, and sometimes wife and husband, brothers and sisters, in the same bed. Under such circumstances, self respect, forethought, all high and noble virtues soon die out, and sullen

64 *Demoralizing and sickly State of Cellar Dwellings.*

indifference and despair, or disorder, intemperance, and utter degradation reign supreme.

"The houses above alluded to are also insufficiently supplied with the necessary in and out of door conveniences, which are required in every dwelling-place. The great mass of them, particularly in the region last referred to, have but one sink, opening into a contracted and ill-constructed drain, or, as is frequently the case, into a passage, way, or street, and but one privy, usually a mass of pollution, for all the inhabitants, sometimes amounting to a hundred. Some of them have neither drain nor privy, and the tenants are obliged to supply their necessities as best they can. Many of them were originally designed for warehouses, and have been converted to their present uses as economically as possible; whilst others, which were once well fitted for the accommodation of a single family, have become wholly inadequate to meet the wants of the large numbers that now crowd into them. A great portion of those in Broad-street and Fort-hill are lofty buildings from three to six stories high, and contain from 40 to 100 inhabitants. The rent for each room ranges from a dollar to one dollar and a half; and is generally collected by a man who hires the whole building, or several buildings, and enforces prompt payment under the threat, always rigidly executed, of immediate ejection.

"Appended to the Medical Report is a sketch of Half-moon-place, which is probably the worst locality in the city. Here the houses are built around an area from which air is almost totally excluded by the perpendicular wall of Fort-hill on one side, and the lofty buildings of Broad-street on the other. A large part of the area is occupied by some 12 or 14 privies, constantly overflowing, and by ill-constructed and worn-out sinks and drains, into which are hourly thrown solid substances of all sorts, which choke them up and cause the liquid parts mixed with them to run over. Into the area there is a narrow entrance from Broad-street, whilst a steep and crazy staircase affords a passage to Humphrey-place, some 50 feet above. Side by side with the staircase, and fully exposed, a large, square, plank drain makes a precipitous descent, conducting, half hidden, half revealed, not only the waste water of the houses in Humphrey-place, but also the contents of its privies to the area below; which, as may be supposed, is redolent of the fact.

"Your Committee have already, in a former communication, described to the Board the state of the cellars under the houses above described; but the importance of the subject, as well as the consideration that the duties of the existing Board will soon be transferred to others, seem to require some notice of them here, even at the risk of repetition. The cellars are generally entirely beneath the surface of the ground, and to most of them the only entrance for light or air is by the passage, or cellar door-way, leading down to them by steps from the side-walk above. They are crowded with families, which lodge there and make them their sole place of abode. Besides a dwelling-house, these places very generally serve the purposes of a grocery and vegetable shop; and not unfrequently a groggery and dancing-hall are added; as might be expected, intemperance, lewdness, and riot, with all the evil spirits to which poor humanity is at any time subject, enter in and dwell there. Few of the cellars have either drains or privies. Some of them are divided off into one or more rooms, into which hardly a ray of light or breath of air passes, and where, notwithstanding, families consisting of several persons reside. How the lamp of life under such circumstances holds out to burn, even for a day, is perhaps as great a wonder as that such a state of things should in this community be suffered to exist. That such residences become the permanent abode of fever, in some of its forms, is well known to the medical men who visit them; and that they tend to shorten life, we may clearly infer from the statistical Tables of Mr. Shattuck, who states that the average of Irish life in Boston does not exceed 14 years. The number of cellars used as dwelling-houses is, according to the return of the city marshal, 586; and the number of persons occupying them varies from 5 to 15."



## RHODE ISLAND.

Dr. Usher Parsons has furnished the following brief abstract of a Report which was presented at the late semi-annual meeting of the Rhode Island Medical Society, by a committee appointed for that purpose. The materials were obtained from a summary of deaths in Providence, prepared by Dr. G. L. Collins, from communications written or verbal, furnished by Drs. Allen, Eldridge, Clapp, Olney, and Bullock, and from the Minutes of the Secretary of the Committee, Dr. C. W. Parsons.

In Providence, the first case of cholera in 1849, was on May 27th, fatal in about 11 hours. Two occurred, both in one family, on June 7th and 11th, another June 29th, another June 30th, all fatal.

" In the week from 1st July to 7th July, 1 death.

"	7th	"	to 14th	"	0	"
"	14th	"	to 21st	"	1	"
"	21st	"	to 28th	"	11	"
"	28th	"	to 4th Aug.	"	14	"
"	4th Aug.	"	to 11th	"	34	"
"	11th	"	to 18th	"	17	"
"	18th	"	to 25th	"	22	"
"	25th	"	to 1st Sept.	"	17	"
"	1st Sept.	"	to 8th	"	12	"
"	8th	"	to 15th	"	9	"
"	15th	"	to 22d	"	9	"
"	22d	"	to 29th	"	3	"
"	29th	"	to 6th Oct.	"	1	"
"	6th Oct.	"	to 13th	"	2	"
"	13th	"	to 20th	"	0	"

" In November three fatal cases occurred.

" The number of cases cannot be accurately given. A large proportion occurring in persons who were ill cared-for, and not being seen by a physician till far advanced, the ratio of fatality was large. Of the cases taken care of by the city, and who were in many respects unfavourably situated, about two thirds died. There was throughout the earlier part of the season in which cholera prevailed, a very general tendency to diarrhoea, and uneasiness about the bowels. A great many cases of cholera came under the notice of physicians, and many which would undoubtedly have run on to severer symptoms, if not promptly met by medical treatment. The reported interments from diseases akin to cholera were as follows :—

	June.	July.	August.	Sept.	October.	Nov.
Cholera Infantum -	-	11	24	9	2	-
Cholera Morbus -	1	2	3	3	-	-
Diarrhoea - -	3	11	11	8	3	3
Dysentery - -	3	1	33	21	10	1

" The total number of deaths in Providence ascribed to these four diseases was, in 1849, 183; in 1848, 192.

"The epidemic haunted particularly certain localities, most of them but little above the water level, and some of them among the most wretched and filthy neighbourhoods of the city.

"Out of Providence, our accounts relate to the following places: Woonsocket, Pawtucket, with the neighbouring villages, Cranston, Warren, Bristol, and East Greenwich.

"Dr. Allen, of Woonsocket, writes that the disease prevailed there about six weeks, beginning about 1st July. He estimates that in a population of over 5,000, there appeared 75 to 100 cases of what 'would formerly have been called cholera morbus of a severe grade,' some cases approaching to a state of collapse, but generally checked in good season. The usual tendency to derangement of the bowels existed here. Meantime other diseases were little seen: there was less sickness and mortality in proportion to the number of inhabitants than in any year for 25 years previous. Dr. Allen mentions that an epidemic jaundice, which has occasionally prevailed in Woonsocket, has had a similar effect on the general health. He thinks that another visitation like the recent one, if as mild and salutary in its influence on health, should be hailed as a blessing, and an occasion for thanksgiving rather than for fasting.

"In the village of Pawtucket eight cases occurred, four of them fatal. In the neighbouring villages, Valley Falls, Central Falls, and about Scott's pond, there were 20 cases, 14 of them fatal. The disease prevailed from the last part of July till the 1st of October.

"In Cranston, along a road near a factory village, there were four cases, and two deaths; at Warren, two cases and one death, about the 1st of August; at Bristol, three fatal cases of doubtful character in July, all of them in coloured persons; at East Greenwich, one severe case on 19th July, recovered—one, 31st August, died in about 20 hours, a third (child of the second) died in two days, a fourth in the same house, 7th September, had severe attack, followed by a sort of typhoid fever, but recovered slowly. Three persons going from this house were attacked, and two died, in other places.

"In several other instances, persons who had been taking care of, or in contact with cholera patients, were attacked after removing to another house or neighbourhood. Thus on the 8th August, an Irishwoman living at Central Falls, five miles from Providence, returned home from Providence, where she had been attending on a patient sick with this disease; that evening she was attacked and died in eight hours. 10th August, her son, living at the same place, was attacked and died in less than 24 hours. The epidemic had not then begun to prevail there. An Irishwoman in Providence, after washing the clothes and bedding of a deceased cholera patient, was attacked in the night and died early the next afternoon. The first of the cases reported in Cranston was in a man who had been taking care of a patient in Providence, and was attacked suddenly soon after going home; he died in about two days. A man living about six miles from Providence came in to attend to burying his sister who had died of cholera in the city. He took home with him the little child of this sister, and next day that child died after a very short sickness, in which vomiting and purging were said to be the prominent symptoms. Next day, while burying this child in the churchyard about two miles from his home, he was suddenly seized with cholera and died in eight hours. 'There was no pulse,' writes Dr. Clapp, 'in 30 minutes from the attack.' Within a day or two another child and an elderly man died in the same neighbourhood of cholera.

"In respect to treatment, our physicians pursued the various courses recommended by the best authorities, and were unable to add anything new."

"(Signed) USHER PARSONS, Chairman."

BALTIMORE.

Baltimore is situated in N. lat. 39° 17', and W. lon. 76° 39', and contains a population of 169,025 inhabitants. It is a compactly built commercial town, lying on the north bank of the Patapsco river, a short, but bold and wide stream, nine miles above its entrance into Chesapeake Bay, and 200 miles inland from the Atlantic Ocean. It is partially divided by an inlet, which extends into the town about one and a half miles. On the north side of this inlet, that portion of the city devoted to commerce and shipping is mainly built; but the populous part of the city is gradually extending around the basin at the head of the inlet to its southern bank, which is the eastern termination of the Baltimore and Ohio railroad, a work intended to connect the Atlantic coast with the great valley of the Mississippi, as well as the outlet for the coal trade of the Alleghany coal basin. From this inlet, which forms a characteristic feature in the scenery of Baltimore, the surface rises towards the north and west into a range of gentle elevations, which extend beyond the town into a series of beautiful and highly picturesque heights, and finally terminate in an undulating country of great salubrity, dotted by the country-seats, occupied by the more opulent inhabitants of the city as their summer residences.

Baltimore is nominally divided into four districts, materially differing from each other in general character and population. 1st. *The Point*, so called because the inlet here diverges from the main stream, is the most easterly part of the city, and commands the greatest depth of water. The greater part of the ship-building and manufactures are carried on here. In addition to the population engaged in these avocations, it is the favourite resort for seamen and newly-arrived emigrants, especially Germans. 2d. *Old Town* lies between the Point and the city proper, and is principally occupied by mechanics and labourers. 3d. *The City*, so styled, which extends over the undulating surface already described, is the centre of trade, and the residence of the more opulent classes. 4th. *The Spring Garden District* reaches from the head of the inlet to the Patapsco river, including the south side of the basin. It is occupied by mechanics, labourers, and a coloured population. Both the Point and Old Town have a gentle inclination towards the water, but without a rapid descent. The city, however, which is divided from Old Town by a rapid stream, possesses a very undulating surface, and may truly be said to have been built "over hill and dale." The Spring Garden District, on the contrary, is level and low, as indeed is the whole bank of the river at that point, and is liable, in common with the opposite bank, to remittent and intermittent diseases. From the clay of this district bricks are manufactured, of unsurpassed excellence, in vast quantities, not only for the use of the city but for exportation, which, by the exposure of a newly-denuded surface, and the collection of pools of water, serves greatly to increase the tendency to febrile diseases.

*Geological Formation.*—The soil on which Baltimore is located consists of clay and sand-hills, covered in many places with a thick coat of gravel. These hills have a north-east and south-west direc-

tion, and the adjacent country is marked by short spurs to the south-east, with rounded summits, between which its drainage is effected. The soil, with an admixture of lime and plaster, is made quite productive ; that consisting of coarse granitic aggregates is reckoned the best. It lies upon the upper limits of the great Atlantic arenaceous and argillaceous deposits, resting upon the chain of primary rocks.

During the spring of 1849, serious apprehensions were felt lest the cholera should visit Baltimore, and these apprehensions were ripened into certainty when it reappeared in New York in May, and in Philadelphia a short period later.

The public authorities, as well as the citizens generally, exerted themselves with commendable zeal to ward off the severity of the anticipated attack, by placing the city in as cleanly a condition as possible. Additional sums were appropriated by the municipal authorities to enable the health department to perform its duty ; and the police were constantly urged to diligence in seeking out and causing to be removed all sources of filth or nuisance.

The following communication from the Board of Health was laid before the mayor, who deemed the matter of sufficient importance to convene a special session of the city councils :—

*“ Office of the Board of Health, May 21, 1849.*

*“ To the Hon. Elijah Stansbury, Mayor of the City of Baltimore.*

*“ Sir,*

*“ The present excited state of the public mind, growing out of the existence of cholera in some of the neighbouring cities, and its anticipated appearance in our own city, and also our unprotected condition, makes it necessary that you, as the chief officer of this corporation, should be informed of the inability of the Board of Health to meet this dreadful scourge.*

*“ The Board does not desire to create any unnecessary alarm by prematurely arousing the community by recommending preparations or measures to avert or lessen the violence of this pestilence should it appear among us. Nevertheless, we feel it our duty to urge upon all to be prepared for its approach. After watching its progress, it is unreasonable to suppose that we shall escape a visitation from it.*

*“ The principal object of this communication is to call your attention to the difficulties that now present themselves to the Board in abating nuisances injurious to health. There are many stagnant pools of water on private property located in the city, requiring draining. There are many other nuisances in existence which, if not abated, will prove fruitful sources of disease. The Harford run is in a disgustingly filthy condition, and requires cleaning. This should be attended to immediately. This subject was presented to the city council at its annual session, and was referred to the Board of Health to have the work done ; but no money was appropriated for the purpose. The Board has also felt the want of means in many other cases where it was necessary to procure agents for disinfecting certain localities inhabited by a miserably degraded portion of the coloured population, among whom existed typhoid fever.*

*“ The Board believes that the ordinances of the city give it full power and authority to remove all nuisances dangerous to health. The appropriation, however, made for that purpose is very small, and barely enough to meet the expenses at a healthy period, and totally insufficient for an extraordinary occasion, such as is reasonably anticipated will occur. The usual method of*

*Prompt Attention to the Subject.—The Epidemic Poison. 69*

abating nuisances will not answer in the cases to which your attention has been called. The Board will soon expend the little means at its disposal, and nothing would be left for ordinary purposes. Before the fines and penalties could be collected for violations of the health laws, the pestilence would have swept over the land. It must also be recollected that these fines do not come into the possession of the Board of Health, but into the city treasury.

"Means should be immediately placed at the disposal of the Board for the purpose of cleansing and disinfecting all public places, and also the property of persons who are either unable or refuse to do it themselves. Cleanliness has done much to mitigate the violence of the disease in other cities; and we may hope, with well directed and proper efforts, either to prevent its introduction and extension, or render it mild in its character, should it appear.

"With these remarks, the subject is left with you to do what in your judgment you may deem proper.

"By order of the Board of Health,  
" (Signed) JOHN F. MONMONIER,  
"City Physician."

Upon the receipt of this communication, the mayor ordered a special session of the city council, before whom he laid the following message :—

*" Mayor's Office, Baltimore, May 24, 1849.*

"To the Members of the first and second branches of the City Council.

"GENTLEMEN,

"I have been induced to convene the council at this time, by the persuasion that the public sentiment demands that the city authorities should adopt speedy and effective measures for the preservation of the health of the city.

"We are admonished by the prevalence of that fearful epidemic, the cholera, in various sections of our country, and its near approach to our city that we can hardly permit ourselves to indulge the hope that we shall escape its visitation. Experience has demonstrated that, by the adoption of wholesome sanitary measures in reference to the purification of the city, that this scourge may, if not averted, be disarmed of its most alarming features: more especially if the efforts of the public authorities are seconded by the action of the citizens, so far as it is within their power to co-operate.

"The duty of providing ample means to enable the proper officers of the corporation to carry into effect the provisions of the several ordinances already existing, and which, in my judgment, are sufficiently ample to meet the exigency, is placed by the charter with your honourable body; and I have every confidence in the liberality which will characterize your appropriations for that purpose, believing that you will consider that the health of the city must be preserved, if possible, at any cost.

"I would respectfully suggest, that in view of the importance of raising the necessary funds for the purpose aforesaid, that the register of the city be authorized to effect a loan of \$,000 dollars, to be placed at the disposal of the Board of Health, to be expended by them as occasion may require, and in order that the responsible duties imposed upon them may be fulfilled.

"Herewith I transmit a communication from the Board of Health addressed to me, and which contains some suggestions which the Council may find useful in their deliberation.

"Very respectfully,  
"(Signed) ELIAS STANSBURY, Mayor."

These measures, however, would have fallen far short of remedying the evils, had not the community, stimulated to exertions by the constant appeals made to them through the public press, come to the

rescue, and aided in discovering and removing all sources of filth or uncleanness in their separate neighbourhoods. The impression was very general that uncleanness had much to do with the spread of the disease; and under this belief, I think, I may safely assert that never before or since was the city ever so thoroughly purified, or so well prepared to receive its unwelcome visitor as during the summer months of the year 1849.

About the 12th of June 1849, and while cholera was prevailing to a considerable extent at New York, Cincinnati, and other places north and west of Baltimore, diarrhoea, and affections of a kindred character, became very prevalent, but yielded easily to medical treatment. I remarked at this time another peculiarity, which I experienced in my own person, and which was of universal occurrence; it was an indefinable sense of oppression, not amounting to pain, over the whole region of the abdomen in all those who had not a positive attack of diarrhoea, reminding the person constantly of the presence of such a part of the body. In about two weeks from the beginning of this prevalence of diarrhoea, all unusual symptoms of it began to subside, and cholera appeared at Richmond and other towns south of Baltimore.

I felt assured at the time of the prevalence of this diarrhoea that the poison which produced cholera pervaded the atmosphere; that it brooded over us, and that we were affected by its presence; and I consequently anticipated, momentarily, an outbreak of the epidemic. These symptoms subsided, and I felt that the fuel necessary to co-operate with this poison did not exist in our city, and that it had passed over and left us unharmed.

I consequently advised a large number of my friends, who were about to leave town under the apprehensions that cholera would soon appear, not to do so, assuring them in the most positive manner of my belief that we should escape the disease, for the reasons already given. They consequently, for the most part, remained, and partook of the ordinary diet usual at this season of the year, including ripe fruits, from which no injurious consequences resulted. On the contrary, the most severe attacks of dysentery I was called upon to attend at a later period in the autumn were among those who had observed a rigid system of diet from apprehension of the appearance of cholera.

On the 1st day of July, an old man named John Cranmer, an inmate of the Baltimore almshouse, suffering from an ulcer, was attacked with unequivocal symptoms of cholera, but recovered.

The Almshouse is situated upon a very beautiful and healthy slope, about two miles north-west of the populous portion of the city, and is in immediate contiguity with the country-seats of several of the wealthy families of the town. It is surrounded by a farm of upwards of 200 acres belonging to the establishment, for the most part devoted to cultivation, and from its position is eminently salubrious.

The main building was originally the country-seat of a wealthy citizen, who erected a costly mansion upon the spot on account of its beauty and healthfulness. The adjoining wings and outbuildings have since been added to afford accommodation to its numerous inmates, who some seasons of the year amount to between six and seven hundred.

*Locality of the Almshouse.—First Cases.*

The whole present principal frontage is to the south, of about 60 feet, of which either wing occupies upwards of 300 feet, and is about 30 feet wide. The main building is occupied by the attendants of the establishment, the east wing by the male, and the west wing by the female inmates.

An enclosure of about four and a half acres, surrounded by a wall, adjoins the building upon its north side. Within this enclosure a building has been erected, on the female side, running in a north-south direction, 70 feet in length, by 30 in breadth, and four stories in height. The lower basement, as well as the second story, is occupied by lunatics; the third, is devoted to foundlings and nurses, and the fourth to aged females.

Each of these stories has windows looking out upon the east and west. In the lower a door opens to the north. All the other stories present a blank front to this exposure. In close proximity to this door is the cesspool which accommodates this building.

Along the northern wall, starting from this point, occur in succession the wash-house, where a large amount of dirty linen is washed, the dead-house, and the men's privy.

Adjoining the east wall and immediately in the rear of the main wing is the black people's hospital. From the north-east corner of this building, a communication exists with the pig-pen outside the wall, where a large number of pigs are usually kept for the purpose of feeding them. About midway in this building, open outside of the wall, is a cesspool.

The grounds gently slope from the south-west corner of this row of buildings to the north-east, overcoming an acclivity of about 10 feet. From the main building north to the wall, which is a distance of about 150 feet, the fall is 14 feet.

In the rear of the north wall is a ravine, which approaches the wall on its western angle, to within about nine feet, the distance between the wall and the ravine gradually widens until it amounts to about 70 feet at its eastern angle. This ravine is the outlet for all the waste water and filth of the establishment which it deposits at some distance below into Rutter's run. It is almost dry in summer, but wet when swollen with rain. The space between the wall and the bed of the ravine is not appropriated to tillage, but grown up with a rank weedy vegetation usually found in rich wet soils.

Previous to the appearance of this case of cholera, the visiting physician, Dr. Thomas Buckler, was quite earnest and emphatic in his directions to have the whole establishment thoroughly cleaned so as to remove all exciting causes of the disease from within. His directions had been carefully complied with, so far as ventilation, removal of nuisances, and cleanliness were concerned.

On the morning of the 7th, a man named Peter Grow Ruburg, who had likewise been an inmate of the house for some time, was attacked by cholera and died.

On the 11th, the disease appeared on the women's side of the hospital; the female attacked died.

On the 12th, two new cases occurred, one on the men's side, the other on the women's; both proved fatal.

On the 13th, a man was attacked and died ; and on the 14th, ten cases appeared in the men's wards, and three in the women's.

In regard to all these cases, I may remark in one word, that they were all old inhabitants of the establishment, and had unequivocally contracted the disease on the spot.

A rumour obtained currency at the time, that the disease was brought from Philadelphia, where it then prevailed, by a poor English traveller, named Alexander Wirt, who was sent to the almshouse on the afternoon of the 7th, and died soon after his admission. In order to arrive at a certainty, if possible, in this matter, I called upon Professor N. R. Smith, of the University of Maryland, as did Dr. Buckler, through whose intervention the man had been sent to the almshouse, who stated that a poor man called at his office for medical aid ; he seemed extremely ill, and threw himself or fell upon a lounge in the office soon after he entered, in a state of exhaustion, and vomited what had the semblance of a rice-water discharge ; his whole appearance led the Doctor to believe that he was in the collapse stage of cholera, and would soon die ; indeed he had fears that he would die before he was removed from the office. Under the influence of a powerful stimulant he partially revived, and was removed in a carriage to his lodgings, where he was refused admittance, and was finally carried to the almshouse. He died two days after his admission, without manifesting any symptoms of cholera, of double pneumonia. A post-mortem examination made a few hours after death, confirmed the correctness of the diagnosis of the attending physician.

Fully impressed with the belief that the disease was dependent for its spread upon some local cause as yet undiscovered, the attending physician, Dr. Thomas Buckler, on the 15th requested the Board of Trustees to meet at the almshouse on the following day (Sunday), in order to authorize the depopulation of the establishment. He proposed to provide the inmates with tents upon a healthy part of the grounds, and to subject the house and adjacent grounds to a thorough purification. The Board adjourned without final action, until the following Wednesday (18th), when the disease had increased to such an extent as to induce the medical attendant to revoke his suggestion as to the removal of the inmates.

Under the direction of the Board, the cholera patients after this date (the 18th of July) were assigned a place in the upper story of the black people's hospital.

Dr. Buckler, who was sadly puzzled at not finding any local cause to warrant the spread of the disease within the enclosure, on the morning of the 19th, determined to investigate the subject fully, and made for the first time a survey of the premises outside of the wall, surrounding the building upon its northern exposure. He commenced his scrutiny on the east wall, and discovered the cesspool connected with the black people's hospital overflowed, and in a very filthy condition ; continuing the inquiry, he found that the drainings from the extensive pigsty had covered a large space with an offensive and putrescent deposit, which covered a large surface of rank grass and rotten weeds, and then found their way to a filthy pool, the contents of which seemed to be in a state of actual fermentation. The next



*Attacks confined to Inmates exposed to this Cause.*      7

object which he met, was a large surface covered with the overflowin contents of the men's privy, and a short distance from this a simila one of greater depth, containing the washings from the dead-house and still further on, a much larger one, at least 30 feet wide, by 4 feet long, and 3 feet deep, about 20 feet from the north wall, leadin from the wash-house, and communicating with a similar one charge with the contents of the cesspool attached to the insane female ward. In short, the whole space included between the ravine and the wall upon its north side, was one putrid and pestilential mass, capable of generating, under the ardent rays of a midsummer sun, the most poisonous and deadly exhalations. Did this cause the spread of cholera among the inmates of the institution?

The inmates in the almshouse when the cholera first made its appearance, numbered						543
Admitted during its prevalence	-	-	-	-	-	88
Born in the house	-	-	-	-	-	1
						<hr/> 632 <hr/>
Inmates discharged during the same period						53
Eloped	-	-	-	-	-	62
Died of cholera	-	-	-	-	-	99
Died of other diseases	-	-	-	-	-	13
Remaining	-	-	-	-	-	405
						<hr/> 632 <hr/>

During the whole period of the prevalence of cholera, that is from the 7th of July to the early part of August, the weather was remarkably fine and seasonable, but a slight breeze set in pretty steadily from the north (although subject to the usual fluctuations carrying the poisonous exhalations from behind the north wall directly over the house.

It will be remembered that in the building running from north to south, on the females' side of the establishment, the lower story had a communication by means of a door to the north, and quite near to the cesspool, and that the remaining stories presented to this point of the compass a blank wall. The whole building was occupied by its inmates as before described. In the lower story were seventeen lunatics, *all of whom were attacked with cholera, and all died. The remaining inmates of the building entirely escaped*; not a single case of the disease appeared in either of the other three stories.

The female wing of the main building is partially protected from the north wind by three intervening rows of trees; and although the number of occupants was greater than on the men's side, yet the number of attacks was considerably less.

This is precisely what might be expected, if we admit the malarial influence already alluded to to have exercised any control over the disease. No arguments can be drawn from the better habits of the females, because they were, in common with the males, equally the victims of intemperance, and equally broken down by poverty and want. Difference of sex does not account for the comparatively small number of cases on the female side. We have already state

74 *Dispersion of Inmates : but no spread of the Disease.*

that upon the male side of the house no barrier interposed between the north wall and the building, and it was consequently completely exposed to the miasmatic influence of the ravine behind.

The first case of cholera was that of an old man who slept in the attic, but spent the greater part of his time in the yard, as, indeed did most of the inmates at this season of the year. The apothecary, and Valentine, the coach driver, occupied rooms in the men's wing, near the main building, with windows opening to the north; they were both attacked with cholera, but recovered.

There were eight medical students attached to the establishment; four of these occupied apartments in the second story of the main building, with a northern exposure; and the remaining four were lodged in similar rooms with a southern exposure. The four students whose rooms were subject to the northern exposure were attacked with the disease; the four, whose rooms were not thus exposed, escaped.

The manager, who slept in a room above that of the students, looking to the north, was likewise seized with the disease, but recovered. His family, whose rooms looked to the south, escaped.

In the cases which occurred among the pauper inmates, those generally were seized who slept in a position which exposed them to the wind from the north.

After the removal of the cholera patients to the ward above the coloured people's hospital, where the influence of the miasma was entirely unobstructed, the severity of the attacks increased, and the chances of cure were diminished.

Some difficulty was experienced in procuring men to remove the nuisance, so that it remained in the condition in which it had been discovered until the following Monday, the 23d of July, on which day nightmen from the city were employed for the purpose. They commenced by draining each pool by deep trenches into the ravine, and then by letting a stream of water from the mill which supplies the house in a full jet, three inches in size, upon them. After their contents were thus washed out, the whole surface was thickly covered with lime, over which was put a deep stratum of earth. The men employed to drain these pools were attacked with cholera in town, but recovered; they did not spread the disease. From the 25th, when the draining was completed, the disease suddenly declined from eleven the day previous to three, and by the 9th of August had entirely disappeared.

While the cholera prevailed at the almshouse, a constant intercourse was kept up between the inmates of the institution and their associates in town. Many left to reside in the city, and in one or two instances persons so leaving were attacked by the disease, and were brought in this state back to the almshouse. The foundlings were likewise removed from the almshouse, and kindly treated by some humane gentlemen in town in their own houses. The houses of Mr. Vansant, the president of the institution, and of Mr. Grafton, one of the trustees, were generously thrown open for this purpose. One of these children only was attacked by the disease; yet, notwithstanding this constant intercourse, the disease did not spread, but confined itself to its favourite haunt.

No cases of cholera were reported by the Board of Health, yet four cases occurred, presenting such unequivocal symptoms of the disease, as to leave but little doubt as to its true nature. Two of these occurred in a wretched tenement, in a very filthy condition, at the corner of Second and Gay streets, near the docks. The patients, a mother and son, both died; they were Germans. The next case was that of a man who lived directly opposite the City Hall. The window of his sleeping apartment looked into an alley which was in the most filthy condition. The fourth case occurred at Barnum's hotel, the largest and most fashionable one in the city, in the person of a traveller; he died in 12 hours after his attack. No other cases occurred; and upon the subsidence of the disease at the almshouse, no new cases occurred.

The facts presented at the almshouse certainly implicated the ravine loaded with filth in its spread at that establishment, and the immunity enjoyed by the populous city in its vicinity, notwithstanding the usual wretched alleys and miserable inhabitants found in all large towns, clearly demonstrated the efficiency of sanitary means in warding off the attack. It is true that the conditions of the atmosphere along the whole seaboard was not favourable to the spread of the disease, but yet it did occur, and proved fatal to a large number of the inmates of the almshouse. No one with these facts before him can doubt that Baltimore would have been visited by cholera as an epidemic; but for the wise precautions taken by the public authorities, seconded by the efforts of the citizens.

**WEEKLY TABLE of MORTALITY from Bowel Affections for the months of June, July, August, and September 1849.**

	Cholera Infantum.	Cholera Morbus.	Diarrhoea.	Dysentery.	Total.
<b>Weeks ending—</b>					
June 9 - -	5	1	2	3	11
" 16 - -	-	-	1	4	5
" 23 - -	11	2	-	4	17
" 30 - -	4	1	2	4	11
July 7 - -	23	1	-	1	25
" 14 - -	22	5	3	1	31
" 21 - -	27	3	1	4	35
" 28 - -	26	8	6	7	47
August 4 - -	30	-	7	6	43
" 11 - -	24	2	4	7	37
" 18 - -	20	2	4	15	41
" 25 - -	24	2	8	10	44
September 1 -	17	1	3	12	33
" 8 - -	14	-	2	15	31
" 15 - -	13	1	3	14	31
" 22 - -	6	-	-	17	23
October 1 - -	13	2	-	9	24
<b>Total - -</b>	<b>279</b>	<b>31</b>	<b>46</b>	<b>133</b>	<b>489</b>

76 *State of the Weather at Baltimore during July 1849.*

Copied from the Log-book of the United States Receiving Ship  
"Ontaria," at Baltimore, during the month of July 1849.

Days.	Midnight.	4 A.M.	8 A.M.	Meridian.	4 P.M.	8 P.M.
1	S.W., cloudy.	W. clear.	N.W., clear.	N.W., clear.	N.W., clear.	N.W., cloudy.
2	N.E., cloudy.	N.E., cloudy.	N.E., cloudy.	N., cloudy.	N., clear.	N., clear.
3	N., clear.	N.E., cloudy.	N.E., clear.	N.E., clear.	N., clear.	N., clear.
4	N.E., clear.	N.E., clear.	N.E., clear.	N.E., clear.	N.E., cloudy.	N.E., rain.
5	N.E., clear.	N.E., cloudy.	S.E., clear.	S.E., clear.	S.E., clear.	S.E., clear.
6	S., clear.	S.W., clear.	S.W., cloudy.	S.W., clear.	S.E., clear.	S.W., slight rain.
7	S.W., rain.	S., showers.	S.W., cloudy.	S.W., cloudy.	S.W., cloudy.	S.E., showers.
8	S.W., rain.	S.W., showers.	S.W., cloudy.	N.E., rain.	S.E., clear.	S.E., clear.
9	N.E., cloudy.	S.E., cloudy.	S.E., clear.	S.E., clear.	N.E., cloudy.	N.E., cloudy.
10	N.E., cloudy.	N.E., cloudy.	S.E., clear.	S., clear.	S.E., showers.	N.E., cloudy.
11	N., cloudy.	N., cloudy.	S.E., clear.	S.E., clear.	S.E., clear.	S.E., clear.
12	N., clear.	N., clear.	N.W., clear.	S.W., clear.	S.E., clear.	S.E., clear.
13	S.W., clear.	W., clear.	N.W., clear.	N.W., clear.	N.W., clear.	N.W., clear.
14	N.W., clear.	W., clear.	N.W., clear.	N.W., clear.	N.E., rain.	N.W., clear.
15	N.W., clear.	N.W., clear.	N.E., clear.	N.E., clear.	N.E., clear.	N.E., clear.
16	N., clear.	N., clear.	N., clear.	S.E., clear.	S.E., clear.	S.E., clear.
17	W., clear.	S.W., clear.	S.E., clear.	S.E., clear.	S.E., clear.	S., clear.
18	S., clear.	S., clear.	S.E., clear.	S.E., clear.	S.E., clear.	N.E., clear.
19	N.W., clear.	W., clear.	S.E., clear.	S.E., clear.	S.E., clear.	S.W., hazy.
20	S.E., cloudy.	S.E., cloudy.	S.E., rain.	S.E., rain.	S.E., rain.	S.E., cloudy.
21	S.W., cloudy.	S.W., cloudy.	S.W., rain.	S.W., rain and thunder, &c.	S.W., rain, thunder, &c.	W., cloudy.
22	N.W., cloudy.	N.W., cloudy.	N.W., clear.	N.E., clear.	N.E., clear.	N.E., clear.
23	N.E., clear.	N., clear.	N.E., clear.	N.E., clear.	E., clear.	N.E., clear.
24	N., clear.	N.E., clear.	N.E., clear.	N.E., clear.	N.E., clear.	N.E., clear.
25	E., rain.	E., showers.	E., cloudy.	E., cloudy.	S.E., cloudy.	S.W., cloudy.
26	S., rain.	S.W., cloudy.	S.W., clear.	S.W., cloudy.	N.W., rain, with thunder, &c.	S.W., cloudy.
27	S.W., cloudy.	W., hazy.	S.W., clear.	N.W., hazy.	N., cloudy.	N.W., cloudy.
28	N. cloudy.	N.W., cloudy.	N.W., cloudy.	N.E., clear.	N.E., cloudy.	N.E., clear.
29	N.W., clear.	N.W., clear.	N.E., clear.	S.E., clear.	S.E., clear.	S.E., clear.
30	S., clear.	S.W., clear.	N.E., clear.	S.E., clear.	S.W., clear.	S.W., clear.
31	W., clear.	N.W., clear.	N.W., cloudy.	N.W., cloudy.	N., cloudy.	N.E., cloudy.

## *Examination of the First imported Cases.*

### GENERAL OBSERVATIONS.

In the preceding history of cholera as it appeared in the United States in the epidemic of 1849, and of which the cases that have since occurred are but the lingering remains, I have endeavoured to present the facts as they occurred, and were recorded at the time. In order that these facts might be more intelligible to the reader, as well as that he might be more fully acquainted with their relations, I have associated with them the medical topography and meteorology of every important place visited by cholera, so far as I have been enabled to obtain them. These facts are as accurate as it is in the nature of things to obtain them, and wherever it could be done, I have allowed the observers (usually men of the highest standing in the profession) to express them in their own language.

The association of climatology and topography with the history of cholera appears to me to be of the first moment, and in summing up the various statements recorded in the preceding pages, I shall endeavour to show the impression the whole mass of evidence has made upon my mind, premising at the same time that the reader will find all the facts before him which I am possessed of, and is therefore enabled to form his own estimate of them and of my judgment. The material facts, I present with great confidence, fully assured of their correctness. My own conclusions I offer with diffidence.

With the facts presented in the preceding pages before us, to what cause shall we attribute the introduction and spread of cholera into the United States in the epidemic of 1849?

Shall we consider the disease as eminently contagious, and having been brought into the ports of New York and New Orleans by the emigrant ships "New York," and "Swanton," and from there disseminated by the same agency along the great lines of trade through the length and breadth of the North American continent?

Or shall we suppose that in its inscrutable progress from the east to the west, it was wafted by the atmosphere over the wide expanse of water which separates the eastern from the western continent, and arrived at New York and New Orleans simultaneously with the two vessels leaving the same port under a remarkable identity of conditions?

Or shall we look upon it as a disease of indigenous origin to every place where it appears, and dependent upon a combination of circumstances connected with the localities which it desolates, which we are at least partially enabled to explain and almost entirely prevent?

When cholera appeared on these two vessels, they were 1,000 miles apart, and each far on its way to its respective port. The first case occurred on the "New York," on the 25th of November 1848, seven days out of port 16 days, and in N. lat. 42°, W. lon. 61°. On the following day, the 26th of November, the first case occurred on the "Swanton" when 27 days out of port, and in N. lat. 25° 47', W. lon. 57°. These cases appeared immediately after a sudden change of weather from an agreeable coolness to one of comparatively unpleasant warmth, accompanied by a peculiarly hot south wind, such as the captain of the "Swanton" had never felt before, and which he describes as "more like artificially heated air, than anything else."

From this time until their arrival at their respective ports they retained the disease on board, and each sent cases on shore. Immediately after their arrival, cases occurred at Staten Island and New Orleans in persons who had never been on board of the vessels, and from this date cholera became epidemic in the United States.

What agency had these vessels in the introduction of cholera? When they left Havre, cholera was unknown there. No manifestation of the disease had then presented itself in all France. It was committing its ravages in various portions of middle Europe, and had extended nearly to the western confines of Germany, but as yet it had not crossed the Rhine, nor developed itself in a single place in the French territory. The passengers it is true were Germans, but they had been domiciliated at Havre for two or three months previous to their departure, and were finally provided with the means of leaving that port by a charitable donation made up for the purpose. They were then placed on board of these ships in a very wretched condition, and suffering from all the privations of poverty and want. They were paupers without means, and dependent on the kind offices of charity for their passage. In what condition they went on board it is quite easy to imagine. The "New York" had 331 of these poor creatures in her steerage, and the "Swanton" 280, besides their cabin passengers and crews. No evidence of the existence of the disease manifested itself until these vessels had been many days at sea, and then immediately upon the occurrence of some remarkable atmospheric phenomena.

Captain Lines of the "New York," states, that immediately preceding the attack the weather became suddenly colder, and there was a general overhauling of chests for warmer clothing. This was succeeded by the rapid alternation of temperature to that peculiar warmth already noticed. From the record of the weather kept on board of the "New York," it appears that on the 23d and 24th the wind was N.N.W. On the 25th it changed to the south, with squalls and rain, and the barometer fell from 30 to 29½ inches. On this day the first case of cholera appeared.

From the period of the arrival of the vessel at New York, until the subsidence of the disease, three or four cases occurred among persons casually thrown in contact with those labouring under the disease, which would appear to give some ground to the doctrine of its contagiousness; two of these were patients convalescing from typhus fever; one a patient convalescing from a fractured patella, and the fourth, a nurse. But one of these, the man with the fractured patella, was thrown in contact with cholera patients; and among the large number of those who had direct intercourse with them no other was attacked.

"There was one very mysterious circumstance," remarks Dr. Stirling, "noticed in the late visitation of the cholera at quarantine, if we view it with the eye of the contagionist: I allude to its restricted limitation, or insulation. By this I mean to imply that the cholera was confined to the quarantine inclosure; it did not overleap its barriers. Notwithstanding more than one hundred of the emigrants landed from the ship 'New York,' scaled the walls, and fled to the city or adjacent villages, this disease would not accompany them; neither did the numerous visitors, whom curiosity or humanity incited to visit the hospitals, receive or convey it. Also, as I am

credibly informed, as soon as these emigrants were brought from the vessel, so soon did the cholera abandon it. The crew, who remained on board, who scrubbed and cleaned the planks, broke up the bunks in which the steerage passengers had slept for weeks, and ventilated and fumigated the hold or between decks, did not contract the disease, but remained quite healthy. The cabin passengers, who, with one of the steerage, went direct to the city, with their effects, did not suffer from the disease, nor communicate it to others. From the foregoing, then, we are naturally brought to the conclusion, that, if the cholera be contagious, a peculiar constitution of the atmosphere must exist in order to favour its propagation."

From all these circumstances, I must conclude that the facts fail to account for the introduction of cholera into New York by direct contagion. How far these attacks of cholera were induced by fear, and its depressing influences, I cannot of course determine; but if these originating at New York had been the result of contagion, would they not have taken place among those exposed to the direct influence of such a cause, in every instance, rather than among those who were in no way, or but remotely, exposed?

Nor do I incline to the belief that its introduction into New Orleans, by the ship "Swanton," is in any manner more fully established. Dr. Fenner informs us, that, for some weeks prior to the appearance of this vessel, there had been observed some remarkable cases of stomach and bowel complaints, simulating so nearly to cholera that, had this disease been present, they would certainly have been pronounced cases of that affection. As early as the 5th of December he attended a gentleman who had the symptoms of cholera so well marked, that he should have pronounced it, but for the absence of the epidemic, a case of that disease. Cases of a similar kind occurred in the practice of physicians in different parts of the city, showing "*that the epidemic influence of cholera was gradually being matured and developed.*"

This was the condition of things when the "Swanton" arrived at New Orleans, and took her position at the dock, at the upper end of the second municipality, on the 11th of December. So rapid was the spread of this disease, that on the 16th it had diffused itself over a large portion of the city, and attacked those who could not, by any possibility, have had any communication with the ship or each other.

Having seen upon what apparently slight grounds the idea of the introduction of cholera, by direct contagion by the ships "New York" and "Swanton," into the United States, is based, I will now proceed to trace its course inland, with strict reference to the solution of this momentous question.

On the 22d of December 1848, Dr. Shanks, of Memphis, was called to see a boy 16 years of age, who had been engaged in selling fruit in town, and was in the habit of visiting steamboats upon their arrival to trade with the passengers. This lad was in a state of collapse when Dr. Shanks saw him, with sunken and injected eyes, husky voice, shrunken tongue, blue, cold, and pulseless, and died the same night of cholera.

This was the first case of cholera that occurred at Memphis, and it is important to ascertain how far he was exposed to direct contagion. It had become generally known that cholera was prevailing to a considerable extent at New Orleans, and for several days, vessels

with cases of cholera on board, were reported as having passed Memphis.

On the 20th of December, the "Convoy," a steamboat engaged in the New Orleans and Memphis trade, arrived with two or three cases among the hands, "*so pronounced by Dr. Ashbell Smith, and other physicians who saw them.*" The lad in question had attended at the landing in his usual vocation, and was there when the "Convoy" arrived, "*but did not go on board.*"

If the cholera was introduced into Memphis by the "Convoy," why were not Dr. Smith and the other physicians, who saw the cholera patients, attacked, instead of the little huckster boy, who was singled out of the crowd of gaping idlers on the shore, and who was so far from being exposed to the direct influence of contagion that "*he did not go on board?*"

On the 26th, four days afterward, 12 men and women were attacked with cholera on board of flat-boats, one fourth of a mile from the steamboat landing, and one hundred and fifty yards from each other. By the 1st of January a considerable number of cases had occurred among the flat-boat population, "*under circumstances that rendered it impossible for the disease to spread by actual contact.*"

The first case of cholera in Nashville was that of a man of intemperate habits, who lived in a house in the lower part of the town, almost surrounded by the water left in the subsidence of a flood which had overflowed that part of Nashville. This attack took place on the 20th of January, and was succeeded by another in the same house on the following day. A third case occurred in the same house on the 22d, when all of the inmates were removed from the house to better quarters, and the cholera ceased among them. The disease, however, continued to spread, and attacked persons in different parts of the town, in no way associated with each other. The disease prevailed among the poor and badly-lodged.

Prior to the 20th, steamboats had arrived from New Orleans, with reports of cases of cholera during the passage.

No detailed account of the origin of cholera at Clarksville, Tennessee, has been published; but Dr. Haskins, who observed the disease at that place, remarks,—

"In the invasion and spread of the cholera over our town, numbering about 3,000 inhabitants, we have been unable to detect anything resembling the invasion and spread of a contagious disease. In the very beginning of the epidemic, several individuals, residing in different portions of the town and having had no communication with one another, were attacked about the same time; and during its whole continuance the cases appeared to arise irrespective of any proximity to the sick, or their residences; the nurses of the sick, and inmates of the same apartments, escaped in nearly all instances.

"The disease having already prevailed for some time previously in both the cities of New Orleans and Nashville, and the steamboats daily landing passengers and merchandize upon our wharves, we were furnished with no facts upon which to found a conclusion as to whether it was brought up or down the river, or what time intervened from the dissemination of the poison to its manifestation in disease. One fact more should be stated, and that is, that no patient with cholera had been landed here, and that our first patients of cholera had seen no cases of that disease.

"The disease prevailed principally among the negro and destitute white population, and but few women or children of any class were subjects of the



malady. No white persons residing in the more cleanly portions of the town, and enjoying the ordinary comforts of life, were attacked, except a few, who were predisposed to gastro-enteric irritation, and even they, without exception, recovered. Disturbances of the healthy action of the stomach and bowels prevailed very generally."

From the commencement of the disease at New Orleans, boats with cases of cholera on board often arrived at St. Louis. These cases were transferred to the St. Louis hospital for treatment, but did not communicate the disease to a single person placed in contact with them. The first case originating in St. Louis, was that of a man, who had lived for some time in the upper part of the town, and had *had no connexion whatever with any one affected with cholera.* This case occurred on the 5th day of January 1849. The second case took place on the 7th, and the third on the 18th, under like circumstances. The disease lingered slowly, and did not break out in its intensity until some months afterwards, when the warm season was far advanced.

Dr. M'Pheeters, to whose able report I am mainly indebted for most of the material facts connected with the epidemic as it prevailed at St. Louis, gives the following facts connected with the subject under consideration:—

"My observation also proves, that those persons, professional as well as non-professional, who regarded the disease as contagious, were more guarded in their intercourse with cholera patients, and suffered far more from fear of the disease than those who viewed it merely as an epidemic affection, and in so far as fear acts as an exciting cause, were rendered more susceptible to it than they would otherwise have been. Thus, many instances of what I shall denominate mental contagion occurred. For example, when a case originated in a family, the panic often became so great that the other inmates of the house would yield so much to the depressing influence of fear as to render them less capable of resisting the pervading atmospheric tendency to the disease; and with every additional case, this cause would act with redoubled force. In this way, I think, much of the so-called contagion of cholera may be accounted for.

"From the beginning of January to the close of the epidemic, there was a constant influx of cholera patients, in all stages of the disease, into the St. Louis hospital, requiring the constant attention, day and night, of numerous nurses, and assistants, both male and female, yet in no single instance did any one of them suffer from the disease. On the female side of the house, and to some extent on the male side, numerous patients, labouring under other diseases, were placed in the same wards with cholera cases, but, as it is believed, without any injury to their health.

"The whole number of inmates in the institution, including the Sisters of Charity, male and female nurses, orphan children, and disabled and indigent persons having no other home,—but exclusive of the patients properly so called,—were 86 in all. Of these, only five died of cholera during the whole season. Two of them were Sisters of Charity, neither of whom, however, were engaged in nursing, the one being exempt from duty on account of age and infirmity, but who occasionally visited the wards for the purpose of administering the consolations of religion to the dying, while the other was engaged as procuratrix of the establishment, and had no connexion whatever with the wards. The remaining three were healthy female children, from four to twelve years of age, all residing in the female ward, common to cholera and other diseases. In addition to the above, a female, recovering from typhoid fever, was taken with cholera and died. Beside these, no other inmate of the hospital suffered with the epidemic. In common with the rest of the community, they occasionally had diarrhœa, which yielded with greater or less readiness to the ordinary remedies."

It is proper to state that Dr. M'Pheeters believes, "that while the disease is *strictly epidemic in its nature*, yet under some circumstances, and to a limited extent, it may also become moderately contagious."

The same facility of intercourse existing between New Orleans and St. Louis was likewise enjoyed by Louisville, and indeed all the other large river towns. Serious apprehensions were indulged that the arrival of cholera patients would give rise to the epidemic at this latter place; but Dr. Bell, who, from his position as the conductor of a medical journal and a member of the Board of Health, was led to examine the subject with great care, predicted that no indigenous case of cholera could occur before May or June, which prediction was fully verified.

On the 1st of May 1849, the first indigenous case of cholera presented itself in a filthy quarter adjoining the river, which had been the abode of cholera during its visitations in 1832 and 1833. On the following day several additional cases occurred. These cases were chiefly confined to a small space between Main and Water streets, but had no connexion with others.

Although the disease had existed for months on the vessels plying between Louisville and the more southern ports, and had been frequently introduced by them into the city, yet it did not spread, and where the cases alluded to did occur, they sprang up without any connexion whatever with the boats, but appeared to originate from some cause within, rather than from any extraneous source. The whole burden of Dr. Bell's testimony on this point is so clear and conclusive as to leave no room for doubt.

In Chicago, the captain of the canal boat "John Drew," was attacked with cholera on the 29th of April, immediately upon the arrival of the boat from the Illinois canal, with a number of emigrant passengers on board, direct from New Orleans. No case of cholera is known to have taken place among the passengers; nor is there any evidence that the captain was in any way exposed to the influence of the disease; other cases occurred soon after in different parts of the city, in such a mode "*that its spread could not be traced.*"

Dr. Evans of Chicago, from whose statement I have derived these facts, has written an ingenious and lengthy paper, to prove the communicability or contagiousness of this disease, and with commendable zeal has taken a vast amount of trouble to procure cases to sustain his position. Some of these are drawn from the epidemic, as it prevailed at a later period at Chicago, and it is hardly probable that he would have passed over the circumstances connected with the introduction of the disease into the place of his own residence, if they could have aided him in establishing his theory. The quietness with which he allows the subject to pass from his hands, clearly shows that the proof of contagiousness could not be made out, as indeed he is forced to confess, and concludes, "it is possible that from this time, a stream of '*cholera atmosphere*' which soon pervaded different parts of the city, continued to flow in by way of the canal." If this disease was wafted into Chicago by a "*cholera atmosphere*" by way of the canal, it certainly did not require the presence of the "John Drew," and its emigrant passengers, or even the navigation of the canal to account for its introduction.

In regard to the spread of the disease over a particular and limited locality, at a later period in the prevalence of the epidemic, and which certainly presents some strong features to those who view cholera as a contagious disease, I would remark, in passing, that the influence of cholera had been felt at Chicago for two months, and that it then became too late to account in this manner for its introduction. It is but reasoning upon matters highly problematical.

In Buffalo, the first indigenous case occurred on the 4th of June 1849, near the workhouse, and one and a half miles distant from the main street. Two cases had previously occurred, and both were travellers; one from Chicago, and the other from Cincinnati; but with these cases the patient who was attacked in the city "could have had no possible connexion."

The second case originating in town was on the 8th. The residence of this patient was on Norton-street, near the ship canal. The third case among the town's-people occurred in Seneca-street, in a different part of the town from either of the others, and in a person who had not in a manner been exposed to the direct influence of contagion. The cases now became more frequent, and appeared in a number of different localities favourable to the dissemination of the disease. I subjoin the following remarks of Professor Flint, who carefully noted the progress of the disease, as highly pertinent and worthy of a candid consideration:—

"It is obvious, from the relative situation of the first cases which successively occurred, and their relation in the order of time, that the disease could not have been transmitted from one person to another. The number of streets in which cases occurred, and that, too, simultaneously, and in rapid succession, is opposed to the idea of its having extended itself by means of a contagious principle. The fact, that while more or less intercourse with the villages in the vicinity of Buffalo was kept up, and some cases occurring in persons coming from the city, no individual living in the country was known to have had the disease, affords negative proof against the doctrine of contagion. It will be conceded that the strongest evidence of the contagious character of an epidemic disease is derived from observations, showing that a person coming from a section in which the epidemic prevails into a region where it is unknown, and there becoming affected with the disease, a greater or less number of those coming into contact with him become affected with the same disease, and it thus spreads over the neighbourhood. This species of evidence of the contagious character of typhus has frequently been offered. The history of epidemic cholera in this neighbourhood furnishes no such proof of its propagation by personal communicability.

"Another method of proving the existence of a contagious principle in any disease is to determine whether the proportion of those brought into contact with persons labouring under the disease, and who become affected with it, exceeds greatly the proportion having the disease of those who are in nowise exposed. We have no data for exactness of computation and comparison on this point as respects the epidemic under consideration. We are sure that in a considerable number of the cases coming under our own observation, the disease could not be accounted for in that way; and, on the other hand, of those constantly in contact with cholera patients, so far as our knowledge extends, a very small proportion only experienced the disease. This fact, however, was noticed among the patients coming under observation, as will appear in tabular abstracts of recorded cases accompanying this article; viz. several members of the same family were frequently attacked, either simultaneously, or successively. Of the cases occurring in our private practice (ten in number), five occurred in two families, three in one and two in the

other; and in each family the several cases occurred at the same time, or with only two or three hours interval. In such instances, of course, the idea that the disease may have been communicated from one to another cannot be entertained; but when cases succeed each other, or follow after a long interval, it may seem to favour the supposition of a contagious principle. It is to be recollected, however, that different members of the same family are generally exposed, not only in the same degree, to the epidemic cause, but also, in a like manner, to the various exciting or collateral causes upon which the development of an attack depends. The latter consideration, it is believed, furnishes an explanation not less rational than the doctrine of contagion.

"At the cholera hospital, as already stated, three cases occurred among the nurses and attendants, but it is to be borne in mind that the situation of nurse or attendant in the crowded wards of a cholera hospital, involves a combination of auxiliary causes, which, acting in conjunction with the special cause, would be rationally expected to induce the disease in a certain proportion of instances. It would, assuredly, not be necessary to revert to the doctrine of contagion to explain the fact just referred to; still if it were constantly observed that a certain proportion of those in close proximity to the sick became affected, it would afford, it must be confessed, grounds for suspecting the presence of a contagious principle. At the hospital of the Sisters of Charity, not one of the nurses or attendants experienced the disease. Owing to the limited number of wards it was not possible to separate cholera from other cases. This was done in so far as it was practicable, in order to avoid unfavourable moral influences, but it was not practicable. In no instance was the disease developed amongst the patients thus exposed. Three cases of cholera, however, occurred among the patients in the hospital. In two of these there had been no exposure; in the third case the person came with other members of the family, labouring under the disease, and was attacked after her entrance.

"Of the physicians of the city, three suffered an attack, all of whom recovered. If we consider the labour performed by practitioners at such a time, and the degree of anxiety incident to their duties, it certainly is surprising that so large a portion escaped, shutting entirely out of view the question of contagion. One of the members of the Board of Health (as already stated), Dr. Haddock, an educated physician, but not a practitioner, fell a victim to the disease. This event occurred early in the history of the epidemic, and tended in some degree to foster popular apprehension lest the disease might be contagious. The circumstances connected with the event, however, were amply sufficient to account for it, without any reference to the doctrine of communicability. Dr. Haddock had been zealously and actively employed in the performance of his official duties, which were superadded to his ordinary business. He possessed an ardent and excitable temperament, and had become intensely engaged in the subject, and, moreover, persisted in his active and exciting labours after distinct premonitory symptoms had appeared; neglecting, also, timely resort to remedies. He died a martyr to his enthusiasm, philanthropy, and public spirit.

"As we have said, we do not intend to discuss the subject of contagion in this connexion. We therefore make no reference to those considerations relating to the general history of the epidemic, which, in our opinion, disprove the existence of a contagious principle as satisfactorily as any point is capable of being established by any other than demonstrative evidence."

The cholera reappeared in New York city on the 11th of May 1849. By a reference to the statements connected with its presence there, recorded in the preceding pages, it will be seen that it selected its first victims among the most worthless inhabitants of the most wretched part of the city. Indeed it would be difficult to find in any city a place more miserable and comfortless than No. 20, Orange-street, where these cases occurred.

A careful investigation disclosed that all the individuals attacked

*Influence of Locality in different Institutions.* 8

had been for weeks residents of the premises where they were attacked, and that the disease originated with them.

Notwithstanding the presence of elements apparently so favourable to the dissemination of the disease it lingered about its original birth place during the entire month of May, and only diffused itself over the city upon the appearance of the warm weather, which characterized the month of June.

In this dissemination, there are few circumstances to indicate even in a remote degree the idea of its propagation by direct contagion and these, when investigated, admit of easy solution. On the contrary the whole proof goes to show that it depended upon some other source for its development and spread. The annexed statistics of the public institutions, obtained from Dr. Buel's excellent report, is pertinent to this point.

*"In the City Hospital."*

"With an average population of about 250 persons, including patients and attendants, only 2 cases of cholera fairly originated in the house. Including these, and 10 other cases labouring under premonitory symptoms were brought in, 12 cases were under treatment; of whom 8 died, and 4 recovered. "The diet of the house was not materially changed during the epidemic. It consisted (the full diet) of fresh beef and beef soup, potatoes and wheate bread. Where any tendency to diarrhoea existed, rice was substituted for potatoes. The nurses in every ward were furnished with opiate powder which were administered on the first occurrence of diarrhoea; to this regulation chiefly the small amount of cholera is to be ascribed. For these facts I am indebted to the intelligent house surgeon, Dr. J. K. Merritt.

*"In the City Prison or 'Tombs.'"*

"We are informed by Dr. Covel, the physician to the prison, that there was actually no cholera originating in the prison.

"The average number of inmates during the epidemic was 250. The average number of committals something more than that. The diet consisted chiefly of beef and beef soup, boiled rice, wheat bread, and coffee. The prison was fumigated several times a week with the fumes of roasted coffee. Sulphur fumigations were also used. To these fumigations, together with extraordinary attention to cleanliness, Dr. C. ascribes this certainly remarkable exemption. Opiates and astringent preparations were kept always at hand and administered on the first occurrence of diarrhoea. Both these institutions are situated in the lower third of the city; and though in this portion of the city the cholera originated, it suffered less from the epidemic influence than many of the upper portions."

*"In the Bellevue Hospital."*

"This institution, situated between Twenty-fifth and Twenty-eighth streets immediately upon the East River, had during the epidemic an average resident population of 477. Considering that these were mostly paupers many with enfeebled constitutions, the amount of cholera and of mortality was very small. 37 cases occurred, of which 29 proved fatal."

*"In the House of Refuge."*

"This institution, situated immediately adjoining the Bellevue hospital, and also upon the East River, had on an average 450 boys and girls in confinement during the season. The high wall, with which it is surrounded interferes to some extent with ventilation. It felt strongly the epidemic influence. Nearly all the inmates, as we are informed by Dr. Carter, suffered from diarrhoea. At least 200 had the rice-water evacuations. By prompt attention to first symptoms, only 3 cases terminated fatally."

*"In the Institution for the Blind.*

"Situated between Thirtieth and Thirty-third streets, one or two squares from the North River. This institution suffered most severely. It has an open, airy, elevated position, surrounded by spacious avenues, but it forms a portion of the Sixteenth ward, where from the action of local or endemic causes, the epidemic influence operated with intense energy. With about 120 inmates, there were 44 cases of cholera, of which 9 or 10 were fatal, and this with all prophylactic measures. We are informed by Dr. Bliss, who had the medical charge of the institution, that but for the timely precaution of removing all the inmates into the country, he believed the greater portion of them would have perished."

*"The Pauper Lunatic Asylum on Blackwell's Island.*

"With an average population of 400 inmates, there were 148 cases of cholera, and 91 deaths. This institution is at all times overcrowded, and among so large a number of lunatics it is, of course, more than usually difficult to ascertain and prescribe for first symptoms.

"With regard to the public institutions on Blackwell's Island; viz. the Almshouse, Penitentiary, and Penitentiary hospital, we have attempted, but without success, to obtain the cholera statistics. No reports from these institutions have been published, and the public know nothing beyond the fact, that there were in them a great amount of cholera, and an extensive mortality. The same remarks apply also to the nurseries for pauper children at Randall's Island, to the emigrant establishment on Ward's Island, and to the Coloured Home."

In regard to the question of contagion, Dr. Buel says,—

"Quite a number of nurses and attendants in the Centre and Thirty-fifth street hospitals were seized with cholera. But in no instance did this occur without a strong exciting cause, either gross intoxication or gross errors in diet. It is worthy of remark also, that the hospital was open 19 or 20 days before the first nurse or attendant sickened. If cholera is contagious, how long is the period of incubation?"

"Another striking fact. In very many instances, females with nursing infants were brought to the hospitals. The children continued to suckle sometimes almost till the mothers died. It is not known in any instance the child contracted cholera.

"Among all the physicians attached to cholera hospitals, and other public institutions where cholera prevailed extensively, not less than 40 or 50 in number, there was not a fatal case of cholera, and indeed we cannot learn that more than two of the whole had cholera at all.

"In the Centre and Thirty-fifth street hospitals, there were at different times eight or nine medical attendants. Several of these passed their whole time, day and night, eating and sleeping in the hospitals; not one had the cholera.

"The writer, upon a careful examination of the facts as they appear to him, does not regard any of them as favouring the doctrine of contagion or personal communicability."

At Albany, Professor McNaughton, as a member of the Board of Health, had ample opportunities of observing and noting the early cases of the disease, which he fortunately availed himself of, for the purpose of solving this very question. The facts obtained by him are already noticed in this report.

The first case took place on the 5th of June, in the person of a resident at the corner of Broadway and Orange streets, who had in no way been exposed. The disease is believed to have originated with himself. The next case occurred on the following day; it was

not more than 30 feet distant, although no intercourse had taken place between them. This patient had had great dread of the disease and had laboured under diarrhoea previous to his attack.

The third and fourth cases occurred in different parts of the city in persons who might have been exposed, but no evidence appears to show that they were. The one had visited New York, and the other was a passenger agent whose business led him to mix with emigrants.

The fifth case, which took place on the 8th of June, at 81, Cherry street, was that of a labourer who had in no way been exposed, and is presumed to have had premonitions of the disease for two or three days previous to the attack.

The subsequent cases all confirm the same opinion. Of all these cases, Dr. McNaughton, who has some leaning to the contagiousness of the disease, says,—

“The history of the recent visitation of cholera in this city, therefore only confirms what has been observed elsewhere, that if cholera is ever propagated by contagion, it is rarely propagated in that manner; and that as far as the evidence yet goes, the probability is, that its extension is dependent upon laws different from those which govern the extension of contagious diseases.”

As favouring the doctrine of contagion, he remarks :—

“The recent epidemic has furnished instances, as it has done in other places, of apparent contagion, or of the portability of some special morbid agent. I will mention a few cases in illustration.

“Mrs. Johnson died of cholera in State-street continued. Her daughter-in-law, Mrs. John Johnson, living corner of Maiden-lane and Lodge-street, a quarter of a mile distant from the residence of old Mrs. Johnson, took the clothes of the latter to her house, and washed them. About eight days afterwards she was attacked with cholera and died. A child of hers, about four years old, was taken the same night, and died; both were taken sick at their residence, but died in the hospital. Another child, about one year old, died at the hospital, in about a week after the mother. Both the children had worn dresses made from the clothes of old Mrs. Johnson. Another Mrs. Johnson, not related to the other family, but living in the same house in Maiden-lane, assisted John Johnson in putting up his wife's clothes, two or three days after her death. The night following she too was attacked with cholera, and died in about a week afterwards. All this looks very much like contagion, or the action of some morbid agent.

“Edward Paley, living at 40, Orange street, was attacked with cholera at 10 a. m., 5th August, and died same day at 4 p. m. His son, 24 years of age, was taken from the jail after he had been asleep. He was much agitated when told of his father's death, and shivered when taken out into the air. When taken to his father's house, the sight of the dead body, and the reproaches of his mother and sisters overcame him, so that he fainted. Dr. Hun was sent for, and saw him about midnight. He found him in the room adjoining that in which the corpse lay; he was sitting on the edge of the bed, had recovered from his fainting, and said he was well; had no complaint in the stomach or bowels. Medicines were left with him, however with directions how to use them, in case of an attack during the night. About five in the morning he was attacked with cholera, and died about ten o'clock in the same morning.

“A young Irish girl, of the name of M'Gue, living at Mr. Bulger's, 24 Orange-street, was attacked with cholera, and was moved, when going into state of collapse, into the house of her brother, Owen M'Gue, 86, Green street, a quarter of a mile distant from the place she was attacked at, where she died in about three days. The night after the funeral, her brother, Owen

M'Gue, was attacked, and *died* the next day. The day after his funeral, Mrs. Chase, living in the same house, 'an intrepid and fearless woman,' as her physician pronounces her, and who had nursed both the brother and sister, was seized, and *died* in a few hours. Within the week, Mrs. Owen M'Gue, who washed the clothes and cleaned up the rooms, was taken ill and *died* in less than 24 hours. These were all respectable people, and lived in a house and in a street not particularly unfavourable to health.

"Other cases might be mentioned in which the disease seemed to be carried from one locality to another, and to extend to the persons who had the most intimate relations with those diseased. It is possible to explain these occurrences without supposing the action of a contagion, or some special poison or morbid agent. The sanitary condition of the several localities was not good. If close quarters and impure air alone were capable of causing sickness, there was enough to account for the attacks. But as the cholera is so very peculiar, and as confined quarters and impure air have existed, in all ages of the world, in every large town, without producing such a disorder until recently, it is manifest that something more is superadded to these common influences to cause an attack of cholera. My time will not permit me to enter upon a discussion of the arguments for and against the contagiousness of cholera. Much the greater number, however, of the best informed members of the profession do not regard the cholera as a contagious disease, but as an epidemic, caused by some peculiar agent, which requires the co-operation of several other agencies before it can produce its full effect upon the human system."

In regard to these latter cases I would remark, that they are by no means so reliable as the former, because they occurred after the disease had disseminated itself over the town, and there is no reason to show why they were not exposed to the same morbid influences which originated the disease in the first cases, without the intervention of contagion.

It appears, therefore, upon a careful and minute examination of all the circumstances connected with the spread of cholera from place to place, that in no single instance is there any evidence furnished by first cases, when the disease could be most easily traced, to show its introduction by direct contagion or personal communication, but, on the contrary, all these circumstances tend to establish the existence of some other and more potent morbid agency.

In forming an estimate of these facts, it must be taken into consideration that they are the accumulated experience of many observers, looking at the subject under different phases, and frequently with preconceived notions; yet, notwithstanding all this diversity of opinion which must necessarily have existed upon a disputable question, and which they have expressed in a manner too clear to leave room for conjecture, their united evidence, when summed up, goes to establish the fact that the spread of cholera is in nowise dependent upon contagion.

Many of these observers are, to a greater or less degree, supporters of the theory of the contagiousness of cholera under certain circumstances, and all of them gentlemen of the highest standing in the medical profession. When, therefore, we find them all speaking the same language, we must admit the correctness of the position assumed. The question, as one of the gravest importance, has met with a corresponding share of attention. If the disease be contagious, no expenditure of money or labour can be too great to keep it from our



### *Influence of Temperature on Cholera.*

ports, or confine it to particular localities if it unfortunately ingress ; but if this be not a contagious disease, how much more than useless would be the adoption of quarantine regulations to oppose its progress ?

Having seen upon what slight grounds the theory of the introduction of cholera by the ships "New York" and "Swanton," its spread by direct communication is based, I desire to call attention to some other particulars connected with its spread, which may draw the attention of other observers to a careful examination of similar phenomena, wherever the disease hereafter occurs.

I have collected together with much care all the topographical and meteorological phenomena I could procure, in connexion with the points in the United States where the disease prevailed, to give the impression that they performed a considerable part in its spread. These facts are before the reader, and he is therefore enabled to draw his own conclusions from them. Taken together, they appear to establish the positions—1st. That cholera is decidedly amenable to temperature ; and 2d. That it is dependent upon the presence of certain agencies, whose prevention is "as much under the power of human reason and industry as the means of preventing the evil of lightning and common fire."\*

The disease appeared at New York and New Orleans during the month of December 1848. Its attack at the former place was decided in its character, but was limited in its influence. From the 60 persons who were attacked at the quarantine-ground, and who must have been exposed to the morbid agency under which the disease was developed, it did not spread, although it is known that numbers escaped from the quarantine and went into the city, and that a considerable intercourse was kept up between those who were within the enclosure and persons visiting them from without. In a filthy German boarding-house, containing about 200 inmates, huddled together in the most disorderly confusion, two cases occurred in individuals who escaped from quarantine. The establishment was broken up, and the inmates scattered over the city, and yet the disease did not follow. A sharp frost intervened ; the weather, though mild and temperate, became wintry, and the disease entirely subsided.

In New Orleans, the month of December, although changeable and although several white frosts had appeared, was for the part very warm and damp. "The streets were as muddy as possible, and the side-walks and walls were reeking with moisture. Heavy fogs overhung the city till late in the morning." Cases of remarkable bowel affections occasionally occurred, showing, says Dr. Felt, "that the epidemic influence of cholera was gradually being manifested in our midst." Several days after these indubitable evidences of the existence of a peculiarly morbid phenomena had manifested themselves, the "Swanton" arrived at New Orleans, and the cholera spread with great rapidity. The temperature, so far from moderating, increased ; so that from the 16th to the 22d of December the thermometer rose to 84°, and the air was so liberally charged with moisture as to impart a feeling of oppressive warmth, amounting to a fever.

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\* Dr. Rush.

almost to a stifling sensation. Under this condition of things, the cholera spread with great rapidity. Without entering into detail, let it suffice to say, that the facts in the preceding pages show that the increase and diminution of the disease maintained a strict uniformity with the rise and fall of the temperature; and that upon the appearance of a sharp frost the disease gradually subsided, to renew its attacks with the increasing heat of the following spring.

In Memphis, from the 20th of October to the 29th of December, with the exception of two or three fair days, it had rained incessantly; the streams were swollen, and the ground saturated with moisture. Conjoined to this uncommon quantity of moisture, the temperature was unusually high for the season, and especially so at the time when cholera made its appearance. The disease was preceded by an epidemic of influenza.

Although occasional cases occurred at St. Louis, Louisville, and Cincinnati during the winter months, yet it required the heat of summer to produce the elements necessary to develop the disease in all its intensity. In all these localities, and indeed, in all of the places visited by cholera, it was found to maintain a remarkable subserviency to thermometric phenomena, increasing with the elevation of the temperature and diminishing with its decline.

Nor was it apparently less under the influence of moisture than of heat. The reader of this Report has had frequent occasion to notice the combination of a high temperature and excessive moisture in the places visited by cholera; and so universally does this law appear to have prevailed that he might almost fix upon the relative fatality of the disease in different places, by noting their thermometric and hygrometric conditions. The disease manifested far greater virulence in the valley of the Mississippi than on the Atlantic coast, and in every place where observations were made, it was found that the quantity of moisture was greater in this valley than on the Atlantic border. May not this conjunction of high temperature and moisture, together with the geological characteristics of this interior valley, account for the greater intensity of the disease there than on the Atlantic border?

The disease usually followed the water-courses, and lingered about the lower grounds upon their banks, seldom extending to the more elevated and drier portions of the places where it prevailed. Its general law, from which there were but few departures, shows that wherever there existed an undrained and marshy or damp locality in a town visited by cholera, united with filth, there the disease was certain to take up its abode, and commit its greatest ravages. So local did it appear in its preferences, that a single street was frequently found sufficient to confine its spread, and in no instance that I am aware of, did it prevail to any extent in high and dry positions. The remarks of Professor Davis on this point, in alluding to the disease as it prevailed in New York, are so pertinent that I cannot refrain from introducing them as the important testimony of an able and cautious observer:—

“It should be remembered that the city occupies a triangular space, the two sides of which are washed by the Hudson and East Rivers, while its base is stretched across the central unoccupied part of the island. The ground was naturally uneven, giving rise to several low, marshy places, which

*High and dry, as compared with damp Ground.*

were more or less perfectly filled up as the city extended its borders. 8 of these places, however, densely populated, still remain much depressed below the general level of the city. One of the most marked of these tracts beginning at the City Prison on Centre-street, extending through the Five Points, across Chatham-street in the neighbourhood of James and Rose streets, to the East River; and thence north-eastward in the direction of Cherry-street to Corlear's Hook. The same may be said of that part of the Thirteenth and Eleventh wards bordering on the East River, and extending between Grand and Fourteenth streets; and that part of the First ward occupied by the south end of West, Washington, and Greenwich streets bordering on the Hudson River. Naturally there existed another low track from the junction of Canal-street and Broadway, in the west and north-western direction, through the Eighth and part of the Ninth ward.

"Now if the reader will bear these geographical facts in mind, while he casts his eye over the map given by Dr. D. M. Reese, in his account of cholera in New York, during the summer of 1832, he will at once perceive their important bearing; for it was precisely in these sections that the disease spent its principal force and violence during that season, as abundantly shown by the detailed reports of the Board of Health, and the hospital physicians of that year. With the exception of that section mentioned as extending through the Eighth and Ninth wards in the direction of Canal, Laurens, and Carmine streets, the parts of the city before pointed out have remained with no essential change, except a supply of Croton water. The streets in the Eighth and Ninth wards, besides being supplied with croton water, have since 1832, been vastly improved by buildings, sewers, paving, &c., &c., so that they rank favourably in their local circumstances with most of the other wards of the city. If we compare the map of Dr. Buel, representing the prevalence of cholera in 1849, with that of Dr. Reese already referred to, we shall see the result; for while we find the disease again commencing, in 1832, in the most sunken part of that tract extending from Centre-street to East River, and extending eastward and northward along the borders of that river, through the Seventh, and Thirteenth, and Eleventh wards, and in the lower parts of Washington and West streets, we find it in the Eighth and Ninth wards comparatively light.

"Thus, according to the statistics of Dr. Buel, out of the 5,000 deaths from cholera in the whole city, 2,400, or nearly one half, were furnished by the Fourth, Sixth, Seventh, Thirteenth, and Eleventh wards, being the tract extending from Centre-street through the Five Points to the East River, and then north-eastward along the border of that river to the neighbourhood of Fourteenth-street. Of the remainder, 300 occurred in the First ward, bordering on the Hudson, and 778 in the Sixteenth ward, also bordering on the Hudson river, but in the extreme north-western part of the city,—leaving less than 1,500 for all the other wards, viz. the Second, Third, Fifth, Eighth, Ninth, Tenth, Fourteenth, Fifteenth, Seventeenth, Eighteenth, and Twelfth, making up the whole central part of the city, and including at least three fourths of the population. It will be observed that a heavy mortality occurred in the Sixteenth ward, the greatest, indeed, except the Sixth, of any ward in the city. And when the reader is informed that this ward mostly occupies *very high* ground—that it is neither thickly covered with buildings, nor densely populated, he will at once begin to conclude, as others have before him, that it militates strongly against the idea that lowness and dampness favour the prevalence of the cholera. And perhaps no more striking illustration of the necessity of a full and minute knowledge of all the facts, and the danger of judging from a few, could be adduced than this.

"We are so accustomed to associate the idea of dryness with elevation, that we very often judge of the former solely from a knowledge of the latter; when, in truth, mere elevation is neither an index of the relative dryness of either atmosphere or soil, as is shown by the highest part of the Sixteenth ward, to which we have alluded. The surface of this tract, though mostly elevated, is uneven, and pretty closely underlaid with micaceous rock, which in some places crops out entirely on the surface. The streets are new, and

neither supplied to any considerable extent with Croton water, nor drained by sewers. The closely underlying rock, especially in the highest part of the ward, prevents the water that falls on the surface from running off, and consequently every depression on the surface, many of which were formed by filling up new streets across low places, were filled with standing water during the whole spring, until *evaporated* by the heat of summer. And not only so, but during the spring, on the height of the ground, all the new cellars (and several long rows of new buildings were in the process of erection,) and many of the old ones were filled with water, and after remaining so for weeks, were only emptied by pumping it out. Such was the character of the Sixteenth ward, so far as regards humidity, although reported as the highest, driest, and most airy portion of the city. I speak of it with minuteness, because it was my fortune to travel over it daily during the spring and summer of 1849, and to attend to some of my worst cases of cholera on its highest points. The York Institution for the Blind is located on this height of ground, concerning which Dr. Buel speaks as follows, viz. 'This institution suffered most severely. It has an airy, open, elevated position, surrounded by spacious streets and avenues, but it forms a portion of the Sixteenth ward, where, from the action of local or endemic causes, the epidemic influences operated with intense energy. With about 120 inmates, there were 44 cases of cholera, of which nine or ten were fatal, and this, with all possible prophylactic measures. We are informed by Dr. Bliss, who had the medical charge of the institution, that but for the timely precaution of removing all the inmates into the country, he believed the greater portion of them would have perished.'

"We should also add, that in the lowest part of this ward, bordering closely on the Hudson river, were several soap-making, bone-boiling, and other like establishments, and one very extensive distillery, in the stables attached to which were congregated several hundred cows."

In all these circumstances, the adjuncts in the production of cholera are found to maintain a striking resemblance to those which produce malarial diseases. If the question was propounded to me, After the collection of all these facts can you tell what is the nature of the cause that produces cholera? I should unhesitatingly reply that *I could not*. But I should give the same answer if I were interrogated concerning the nature of autumnal fever. It is true I might reply, in regard to fever, that it depended upon the presence of malaria. But what is malaria? It is the decomposition, under certain known circumstances, of vegetable matter. These circumstances are the presence of air, heat, and moisture. Whenever these elements unite in due proportion, fever is produced, but if either be wanting, malaria is not generated. Hence during the cold of winter and the dryness of midsummer we have no fever, but with the decomposed vegetation of autumn, united with the heat and moisture of that season of the year, fevers prevail. Heat and moisture cannot produce fever; it requires decomposed matter, uncleanness, and filth. These are precisely the circumstances under which cholera makes its appearance, and the reader will have had frequent occasion to observe how much it is under the conjoint influence of elevated temperature and moisture, and how steadfastly it dwells among filth and uncleanness.

I do not assert that the cause of autumnal fever and cholera are identical, but I do aver that the whole history of the epidemic, as it prevailed in the United States, proves that it cannot exist in the absence of those conjoined elements known to produce fever; and no facts more fully substantiate this position, than those connected with its prevalence at the Baltimore almshouse, and its absence in the city

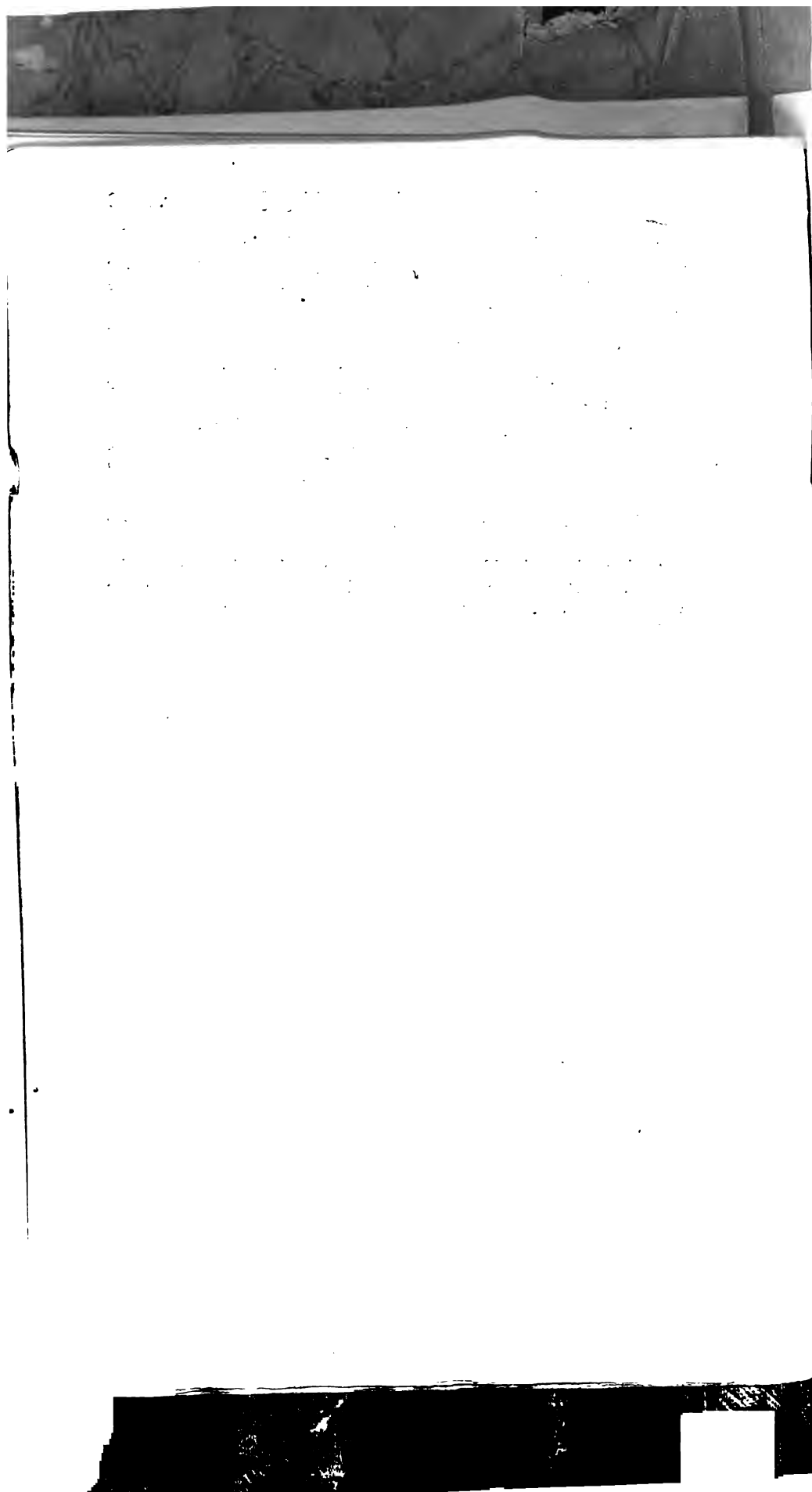
*The Pestilence will aid in abolishing Quarantine.* 93

as an epidemic. No person will fail to recognize, in the filthy condition in which this establishment was kept, a sufficient cause for disease, and no one can doubt the influence it exercised over the spread of cholera in this immediate locality.

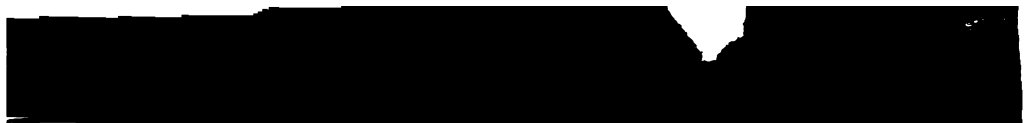
If this position be fully substantiated, have we not the means in our own hands of arresting its desolating ravages? Does not this disease present itself as a teacher as well as a scourge? Every one must admit the justice of the following observations of Professor Caldwell:—

“Cholera, though a fatal scourge to the world, will, through the wise and beneficent dispensation under which we live, be productive of consequences favourable alike to science and humanity. Besides being instrumental in throwing much light on the practice of physic, it will prove highly influential in extinguishing the belief in pestilential contagion, and bringing into disrepute the quarantine and sanitary establishments that have hitherto existed.”

If these facts should prove to be true, and if they arouse the public authorities of large towns to the immense responsibility under which they hold their offices, these pages will not have been written in vain.



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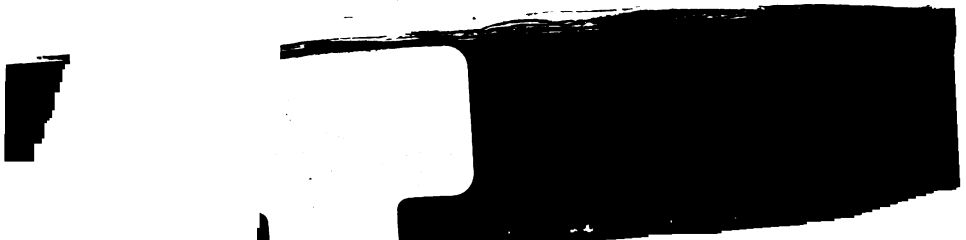


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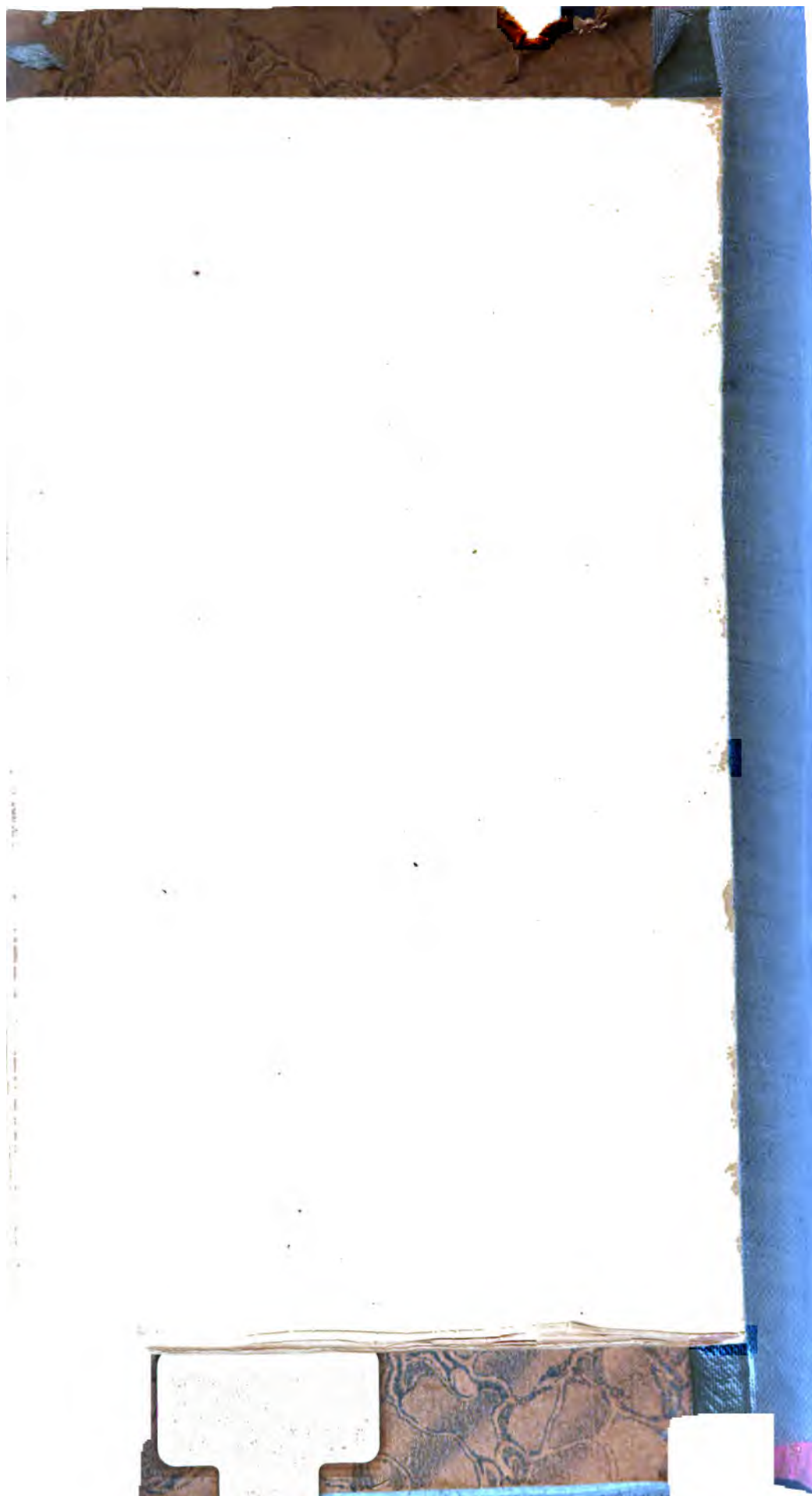


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Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,  
Printers to the Queen's most Excellent Majesty.  
For Her Majesty's Stationery Office.



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